

## TECHNICAL MEMORANDUM

DATE: January 19, 2015  
TO: Rob Rau, SME, EPA Region 10  
FROM: Julie Sharp-Dahl, Project Manager  
Bristol Environmental Remediation Services, LLC  
RE: EPA Contract No. EP-W-12-009  
Task Order (TO) 1006, Site Assessment and Remediation at Western Gas

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Bristol Environmental Remediation Services, LLC (Bristol) prepared this Technical Memorandum (Tech Memo) at the request of the U.S. Environmental Protection Agency (EPA). The Tech Memo provides results for the August 2014 assessment and remediation activities at the Western Gas Leaking Underground Storage Tank (LUST) site in Toppenish, Washington, located on the Yakama Indian Reservation. The tasks associated with TO 1006 included decommissioning two onsite groundwater monitoring wells, installing a replacement groundwater monitoring well (MW-2B), and performing a third round of remedial injections as part of the corrective action at the Western Gas Site.

### SITE INFORMATION

The Western Gas Site is located on the Yakama Indian Reservation at 401 S. Elm Street, Toppenish, Washington (Figure 1). The site is 0.9 acres, bounded by 1st Avenue to the north, a Taco Bell and Kentucky Fried Chicken to the south, Elm Street to the east, and El Gallo Giro Grocery and Taco Shop to the west. The site supports a concrete pad, a gas station island with canopy, and the Western Gas convenience store (Figure 2). The majority of the site is paved. EPA Region 10 lists the site as an active LUST site (EPA, 2012) and identifies it as EPA Facility No. 4260105.

## **SITE GEOLOGY AND HYDROLOGY**

Groundwater is approximately 13 feet below ground surface (bgs) with seasonal variations of 6-8 feet which are a function of irrigation and recharge (EPA, 1997). In general, groundwater flows southeast. There is a municipal water supply well approximately 1,000 feet east-southeast of the site. Site soil is composed of clayey silt with sand and gravel to a depth of 7 to 10 feet bgs; silty, sandy gravel with cobbles underlies the clayey silt.

## **SITE HISTORY**

From the early 1950s through 1991, the property operated as a bulk plant for the distribution of petroleum products as well as a mini-mart and car wash where petroleum products were sold. Contamination was first identified at the site in 1991 (White Shield, 1991). Bristol's *Corrective Action Plan* presents a detailed summary of environmental activities conducted at the Western Gas Site from 1991 through 2012 (2013b).

In 2012, the EPA tasked Bristol to perform a site assessment at the Western Gas Site. Bristol performed the site assessment in November 2012. During the assessment Bristol advanced six direct-push borings, installed three temporary monitoring wells, redeveloped existing monitoring wells, and collected subsurface soil and groundwater samples. Site assessment results indicated that the majority of petroleum contamination remaining on the site is isolated to the southeast corner of the property. This is an area that was not excavated during previous contaminated soil removal efforts due to proximity to Elm Street. Site assessment activities are described in greater detail in Bristol's *Site Assessment Report* (2013a).

In 2013, the EPA tasked Bristol with performing corrective action at the site; chemical oxidation and enhanced bioremediation was the chosen approach. In September 2013, Bristol cored two direct-push borings, collected one soil sample, advanced six injection points, and injected RegenOx into the subsurface at each injection point. A second round of treatment

was performed in March 2014. See the *Corrective Action Plan* (Bristol, 2013b) for further details of the technical approach.

EPA collected groundwater samples from monitoring wells MW-1 and MW-2 in February 2014, after the initial injection event in September 2013; groundwater samples were collected again in June 2014 after the second injection event in March 2014; and in December 2014. All analytical results for groundwater samples collected from MW-2 (including historic data), as well as the results from the groundwater sample collected from replacement well MW-2B, are presented in Groundwater Analytical Results section of this Tech Memo.

#### **CONTAMINANTS OF CONCERN**

Results from the 2012 site assessment indicate that total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) and diesel range organics (DRO) are the contaminants of concern (COCs) at the Western Gas LUST Site.

#### **SCOPE OF WORK**

The scope of work for Task Order 1006 was to decommission two onsite groundwater monitoring wells; install, develop and sample the replacement groundwater monitoring well (MW-2B); and perform a third round of remedial injections in accordance with the approved *Corrective Action Plan* (Bristol, 2013b) and the *Quality Assurance Project Plan for Region 10, LUST Sites in Indian Country* (QAPP; Bristol, 2014).

This Tech Memo details the third remedial treatment injection at the site. As detailed in the *Corrective Action Plan*, Regenesis initially recommended using three to five injections of RegenOx to treat the soil contamination, followed by one injection of ORC Advanced to treat the remaining low-level groundwater contamination. The first two treatments used the RegenOx product. Under this TO Bristol provided Regenesis with the MW-2 (compliance well) analytical results from the EPA's 2014 groundwater sampling events and requested

Regenesis to confirm the use of RegenOx for the third injections. Based on the groundwater results following the treatments to date, Regenesis recommended a combination of RegenOx and ORC Advanced for this third round of injections because using both products will give faster results from chemical oxidation (RegenOx) along with a lingering oxygen source (ORC Advanced) to help stimulate bioremediation for approximately 12 months.

## **CORRECTIVE ACTIONS**

Corrective actions were performed at the Western Gas Site on August 20 and 21, 2104.

Bristol obtained all required permits; performed utility locates; decommissioned two onsite groundwater monitoring wells (MW-1 and compliance well MW-2); installed, developed, and sampled the new compliance well MW-2B; advanced six injection points using direct push technology, and injected a combination of RegenOx and ORC Advanced into the subsurface at each injection point.

Well decommissioning, well installation, and injection activities were performed by Bristol's subcontractor Pacific Soil & Water (PS&W) located in Tigard, Oregon. Field oversight was performed by Bristol's field technician and site supervisor, Patrick Braley. The EPA Subject Matter Expert (SME), Rob Rau and assistant SME David Domingo were onsite for project startup. Mr. Rau signed the Yakama Water Code Administration permits, and directed the placement of the new monitoring well and injection points.

This Tech Memo includes six attachments:

- Attachment 1 – Figures 1 and 2
- Attachment 2 – Photograph Log
- Attachment 3 – Field Notes and Forms
- Attachment 4 – Permits
- Attachment 5 – Laboratory Analytical Data Package
- Attachment 6 – Waste Disposal Documents

## **UTILITY LOCATES**

Bristol used the Washington Utility Notification Center to contact utility companies and request that locations of underground utilities be marked prior to mobilizing to the Western Gas Site. Bristol also hired a Yakima utility locate service, Utilities Plus, LLC, to do additional screening for underground utilities that may be in the treatment area.

Only one underground utility was identified through these means: a landscape irrigation water line runs through the area, but it is currently not in use (Figure 2). A gas line was identified along the southern edge of the property, between Western Gas and the Taco Bell and Kentucky Fried Chicken.

## **MONITORING WELL DECOMMISSIONING**

Bristol decommissioned the two onsite groundwater monitoring wells, MW-1 and MW-2, by removing the protective covers, filling the 4-inch wells with bentonite chips to the top of the well, and then hydrating the bentonite with water. After the bentonite was hydrated, asphalt was placed over the top to patch the hole. The concrete well pad was broken up using a jackhammer, and disposed offsite.

## **GROUNDWATER MONITORING WELL INSTALLATION**

Bristol's subcontractor PS&W installed and developed replacement compliance well MW-2B. The well is a 2-inch diameter, schedule-40 PVC, flush-mounted well that was installed to 20 foot bgs with a direct push drill rig. The well has a 10-foot long, 2-inch diameter pre-packed screen with 20/40 sand and a 65 mesh stainless screen; the screened interval is from 8 to 18 feet bgs. The annular space between the filter pack and the borehole wall was filled to 2 feet above the top of the screen with 10/20 sand. Two feet of bentonite chip seal was placed above the sand. Granular bentonite was used to seal the well to near ground surface. Bristol installed the flush surface monument by cutting a 2- by 2-foot square through the asphalt,

dug out the surface soil to approximately 1 foot deep, and filled the square with ready mix concrete to secure the monument.

The new well was developed within two hours of installation. Granular bentonite, which hydrates in approximately one hour, was used to seal the well instead of grout because the granular bentonite will not be pulled down the sand pack during well development. Well development consisted of routinely surging and purging the well with a 2-inch-diameter surge block until relatively clear water was produced and all water quality parameters, with the exception of turbidity, stabilized. The calculated well volume was 5 gallons, which, if three well volumes were removed, would result in approximately 15 gallons of development water that would need to be removed to properly develop the well. After removing 35 gallons of development water, turbidity was still higher than the criteria specified in the QAPP. After consulting the EPA SME, Bristol stopped development and let the well rest for an hour before sampling; samples would be collected after 30 minutes if the turbidity did not stabilize during the low-flow purging.

#### **GROUNDWATER SAMPLING REPLACEMENT WELL MW-2B**

Bristol began low-flow purging of MW-2B an hour and a half after the well was developed. Water quality parameters were monitored every 3 to 5 minutes until all parameters stabilized. All the measured parameters stabilized within 30 minutes, with the exception of turbidity, which remained over 500 NTU.

#### **INJECTIONS**

The treatment area was defined in the *Corrective Action Plan* as a rectangle measuring 30 feet long by 15 feet wide, located between the former soil excavation and Elm Street. Figure 3 depicts the six injection points from this third round of injections, as well as the twelve injection points from the first two rounds of injections. Based on Regensis' recommendation, the injection points were offset by approximately 4 feet from the previous

round of injections. The treatment interval for each injection point during this third round of injections was 12 to 18 feet bgs. For each injection point, approximately 150 gallons of water, 65 pounds of RegenOx Part A, 40 pounds of RegenOx Part B, and 40 pounds of ORC Advanced were used.

The RegenOx and ORC Advanced reagents for each injection point were mixed in 5-gallon containers, added to a poly tank containing 150 gallons of water, and mixed continuously until injected. The poly tank was staged on a platform so that the valve was located above the injection pump, allowing the solution to be gravity-fed into the pump's hopper. Once well mixed, the solution was gravity-fed into a hopper. To inject the treatment solution, the Geoprobe rig was staged at the injection point and the pre-probe with an expendable tip was driven to the bottom of the treatment interval, 18 feet bgs, with standard 1-inch diameter drive rods, and the expendable tip was disconnected.

Once the hopper was filled, an injection manifold (outfitted with a pressure gauge and a release valve) was connected to the top of the drive rods, and the injection pump was connected to the injection manifold with a hose. A total of 25 gallons per foot, starting at 18 feet bgs and ending at 12 feet bgs, were injected at each point. Once the injection was complete, the pre-probe and drive rods were removed and the open borehole was slowly filled with bentonite pellets to within 0.5 feet of the ground surface, and hydrated. The borehole was then finished with a surface seal of quick-set concrete and an asphalt patch.

#### **FOLLOW ON GROUNDWATER SAMPLING DECEMBER 2014**

The Region 10 EPA SME collected a groundwater sample and field duplicate from MW-2B December 1, 2014, and provided the results to Bristol for verification and reporting.

## GROUNDWATER ANALYTICAL RESULTS

Table 1 presents the verified analytical results from the groundwater samples collected from MW-2B August 20 and December 1, 2014. As applicable, all available analytical results from MW-2 samples are correlated with the number of remedial treatments.

The analytical laboratory reports note that the diesel chromatograms of the groundwater samples collected from MW-2 have a hydrocarbon pattern that closely resembles weathered gasoline and/or weather kerosene.

**Table 1 Analytical Results from MW-2 and MW-2B**

Sample Date	Treatment #	TPH-gas (mg/L)	TPH-diesel (mg/L)
May 1995	MW-2 Pre-treatment	13.8	< 1.0
November 1995	MW-2 Pre-treatment	5.1	NT
August 1996	MW-2 Pre-treatment	< 1.0	< 1.0
December 1996	MW-2 Pre-treatment	1.1	ND
July 2000	MW-2 Pre-treatment	7.1	0.14 J
May 2001	MW-2 Pre-treatment	3.3	NT
November 15, 2012	MW-2 Pre-treatment	2.9*	1.2*
February 25, 2014	MW-2 Post-Treatment #1	4.10*	1.4*
June 4, 2014	MW-2 Post-Treatment #2	1.88*	0.99*
August 20, 2014	Replacement well MW-2B	5.6*	1.4*
December 1, 2014	Replacement well MW-2B	1.52*	0.43*

Notes:

**Bold concentrations exceed MTCA Method A cleanup levels:** 1.0 mg/L for TPH-gas and 0.5 mg/L for TPH-diesel.

\*Presented results are the higher of the primary and duplicate sample results.

< = less than

ND = not detected

J = estimated concentration

NT = not tested

mg/L = milligram per liter

TPH = total petroleum hydrocarbons

The Bristol chemist reviewed the August and December 2014 groundwater analytical data presented in Table 1 in accordance with the QAPP. The data met QAPP criteria. The analytical results are usable without qualification.



## **INVESTIGATION-DERIVED WASTE DISPOSAL**

Two drums of investigation-derived waste (IDW) were generated during well installation and development: one 55-gallon drum approximately three quarters full of drill cuttings, and one 55-gallon drum of groundwater from well development and sampling. Emerald Services picked up the IDW on October 8, 2014 during a regularly scheduled waste pickup in Toppenish and disposed of it at their waste facility in Spokane Valley, Washington. Waste disposal documents are included in Attachment 6.

## **RECOMMENDATIONS**

The EPA will continue the groundwater monitoring program at the Western Gas Site until contaminant levels are below MTCA Method A cleanup levels.

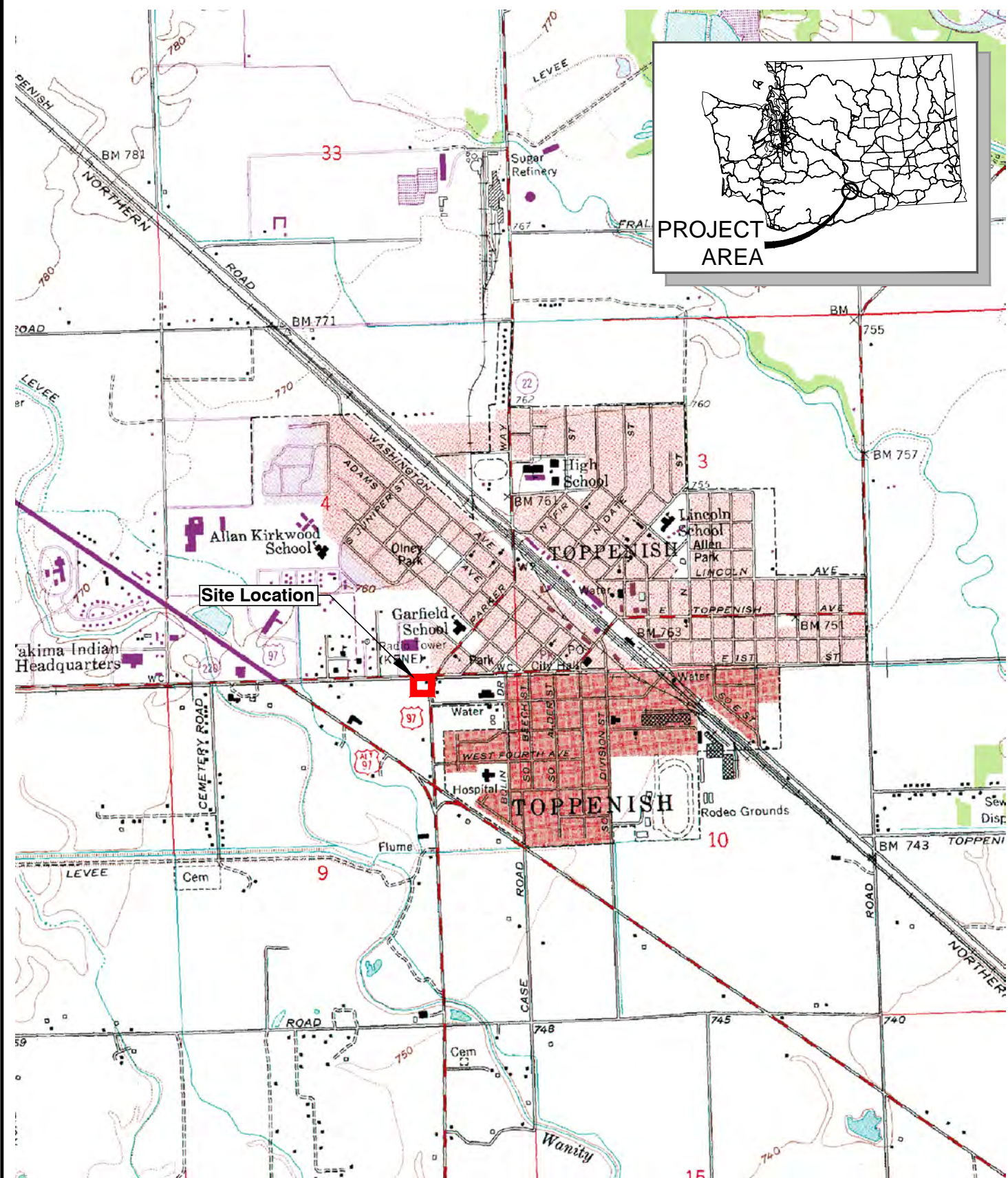
Using both of the Regenesys products will give faster results from chemical oxidation (RegenOx) along with a lingering oxygen source (ORC Advanced) to help stimulate bioremediation for approximately 12 months. Therefore, Bristol recommends follow-on groundwater sampling until the summer of 2015 to determine if additional injections are necessary to enhance site cleanup.

## REFERENCES

- Bristol Environmental Remediation Services, LLC (Bristol). (2014). *Quality Assurance Project Plan for Region 10, LUST Sites in Indian Country* (revision 1).
- Bristol. (2013a). *Site Assessment Report* (revision 1). Western Gas LUST Site, 401 S. Elm Street, Toppenish, Washington,
- Bristol. (2013b). *Western Gas, 401 S. Elm Street, Toppenish, Washington, Corrective Action Plan* (revision 1).
- Bristol. (2013c). *Western Gas Corrective Action* EPA Contract No. EP-W-12-009, Task Order B-7, Amendment 1. Technical memorandum.
- U.S. Environmental Protection Agency (EPA). (1997). Basis of Decision, Brand X Tank n' Tummy. EPA UST Facility No. 4-26105. Toppenish, Washington.
- EPA. (2012). EPA Region 10 active LUST sites on Indian lands. *EPA.gov*. Retrieved from [http://yosemite.epa.gov/r10/water.nsf/UST/UST+Info+Resources/\\$FILE/Active-IL-LUSTs.pdf](http://yosemite.epa.gov/r10/water.nsf/UST/UST+Info+Resources/$FILE/Active-IL-LUSTs.pdf)
- White Shield, Inc. (1991). *Site Assessment Report for Underground Storage Tank Closure at Brand X Tank & Tummy*. Toppenish, WA.

## **ATTACHMENT 1**

Figures



Topo Reference  
 USGS

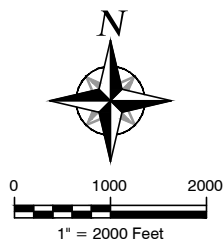


FIGURE 1  
 EPA 1006 WESTERN GAS  
 401 S. ELM ST.  
 TOPPENISH, WA 98948  
 SITE LOCATION MAP

**Bristol**

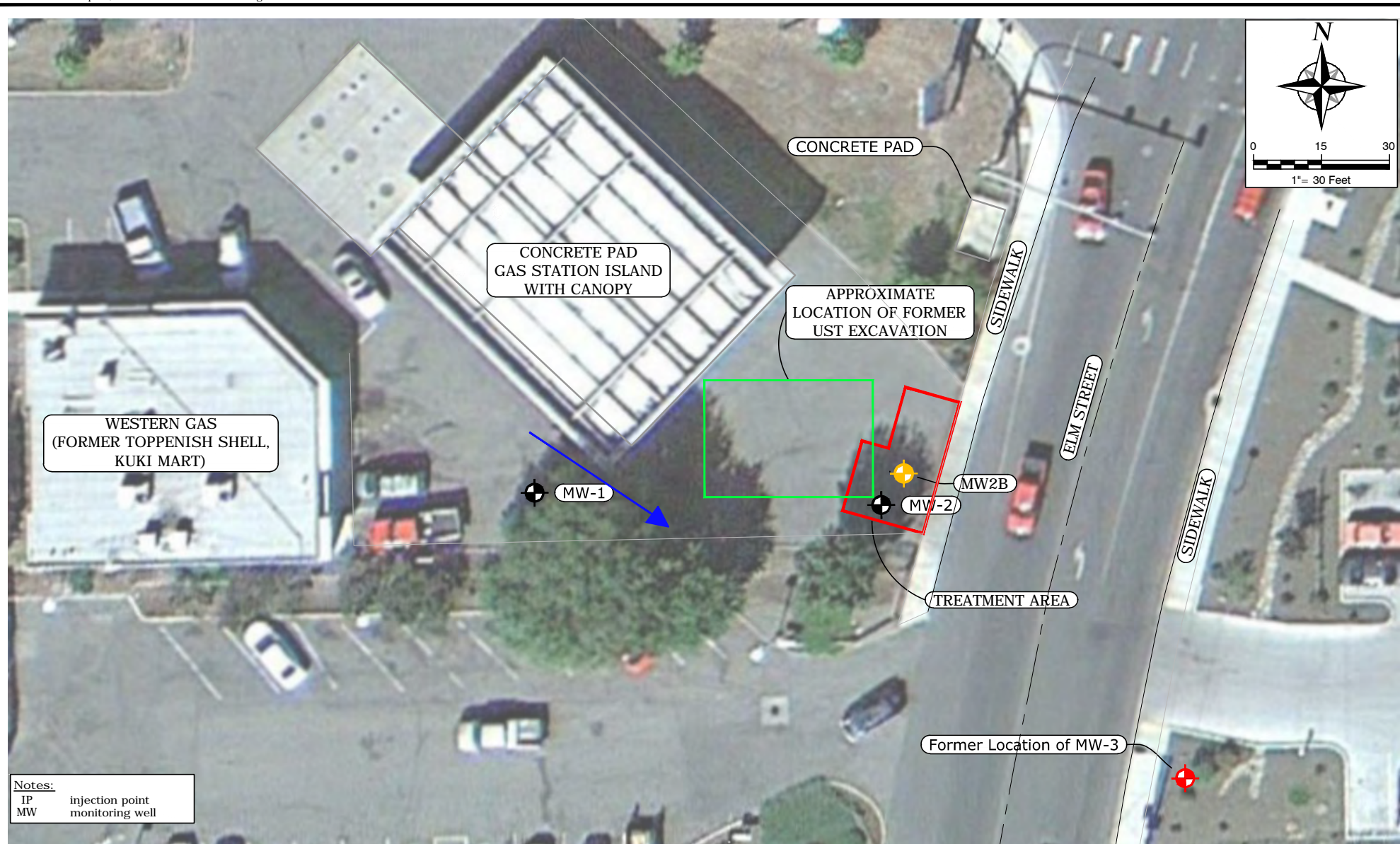
ENVIRONMENTAL  
 REMEDIATION SERVICES, LLC

Phone (907) 563-0013 Fax (907) 563-6713

DATUM:  
 NAD27  
 PROJECTION:  
 UTM WA Z10 M  
 PROJECT NO.  
 34150026

DATE 06/13/2014  
 DWN. NAP  
 SCALE 1" = 2000'  
 APPRVD. JSD





Notes:  
 IP injection point  
 MW monitoring well

### Legend





-  Decommissioned Monitoring Well
-  Former Monitoring Well
-  2014 Monitoring Well
-  Groundwater Flow Direction

FIGURE 3  
 EPA 1006 WESTERN GAS  
 401 S. ELM ST.  
 TOPPENISH, WA 98948  
**SITE MAP**

**Bristol**

ENVIRONMENTAL  
 REMEDIATION SERVICES, LLC

Phone (907) 563-0013 Fax (907) 563-6713

DATUM:  
 NAD 83  
 PROJECTION:  
 WA SP ZS FT  
 PROJECT NO.  
 34150026

DATE 08/28/2014  
 DWN. NAP  
 SCALE 1" = 30'  
 APPRVD. JSD

# Bristol

 ENVIRONMENTAL  
REMEDIAL SERVICES, LLC

Phone (907) 563-0013 Fax (907) 563-6713

DATUM:  
NA  
PROJECTION:  
NA  
PROJECT NO.  
34150026

DATE 08/28/2014  
DWN. NAP  
SCALE 1" = 5'  
APPRVD. JSD

**ATTACHMENT 2**

Photograph Log





**Photo 01:** Injection points for the third round of treatment, and replacement monitoring well MW-2B location.  
**Direction:** South

**Date:** 8/20/14  
**Photographer:** P. Braley



**Photo 02:** Installation of monitoring well MW-2B.  
**Direction:** West

**Date:** 8/20/14  
**Photographer:** P. Braley





**Photo 03:** Developing monitoring well MW-2B.  
**Direction:** Northeast

**Date:** 8/20/14  
**Photographer:** P. Braley



**Photo 04:** Well completion MW2B  
**Direction:** East

**Date:** 8/20/14  
**Photographer:** P. Braley





**Photo 05:** Groundwater sampling at MW-2B.  
**Direction:** Northwest

**Date:** 8/20/14  
**Photographer:** P. Braley



**Photo 06:** The turbidity measurements for MW-2B remained high after well development and purging prior to sample collection..  
**Direction:** West

**Date:** 8/20/14  
**Photographer:** P. Braley



**Photo 07:** Setting up to perform the injections of the treatment solution.

**Direction:** Southeast

**Date:** 8/20/14

**Photographer:** P. Braley



**Photo 08:** The treatment reagents were mixed in a hopper prior to injection.

**Direction:** North

**Date:** 8/21/14

**Photographer:** P. Braley





**Photo 07:** The treatment reagents were initially mixed in 5-gallon buckets, then transferred to the hopper for further mixing prior to injecting the solution into the subsurface.

**Date:** 8/21/14

**Photographer:** P. Braley

**Direction:** North



**Photo 08:** Grouting and applying an asphalt patch at an injection point.

**Date:** 8/21/14

**Photographer:** P. Braley

**Direction:** East





**Photo 07:** Decommissioned MW-1.  
**Direction:** Ground

**Date:** 8/21/14  
**Photographer:** P. Braley



**Photo 08:** The EPA Subject Matter Expert provided direction on the location for the replacement well MW-2B, and the location of the injection points.  
**Direction:** Northeast

**Date:** 8/20/14  
**Photographer:** P. Braley

### **ATTACHMENT 3**

#### Field Notes and Forms

Monday 8/18/14

0700 Arrive Office

- Gear & last minute items.
- Discuss schedule w/ JSD.

0830 Arrive Airport

- Check in

1010 EST Depart to Seattle.

1730 Arrive YAKIMA, WA.

- Gear
- Vehicle/Rental
- Go by site

2000 Send Email to T/A % Melissa  
+ JSD - That 2nd Cooler is not here.

End of day

Greg  
401  
34.50/d

Tuesday 8/19/14

0800 Arrive VNE offices

- Drill permits Have not been issued.
- Stop by site & talk w/owner
- Utilities are marked
- Locate AK Cargo

1000 Call T/A

- Not enough labels
- Missing cooler

1030 Wil B. (VNE) calls & says  
Pacific S&W Business Lic. was  
submitted along w/cheek  
to water Dept. (Britney),  
but is missing.

- Wil B. will go to Britney &  
see if he can help locate  
missing paperwork.

1100 Fill out elec. COC & labels, etc.

1200 JSD calls & Business license  
has been located.

- Now must wait on signatures.

\* P&W (Brad) in YAKIMA.

1300 Work on sample labels.

→ 28 containers & only 10 labels.

Rite in the Rain

4 Tuesday 8/19/14

1370 Go to OFFICE MAX to have labels printed.

1400 NO word about permits. STANLEY.  
- continue sample process.

1430 Talk w/ Rob Rau EPA + is hopeful to have permit @ anytime.

1500 Permit is ready for EPA signature + pick up.

- Decide to START work Wed. morning. Rob Rau will pick up permit 1st thing + be on site around 0815 Wed.

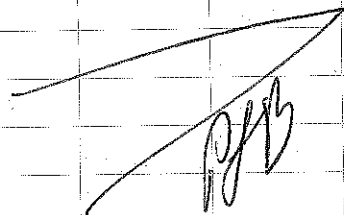
- CALL PS+W Brad + go over MW instal, 2 well Decomish, + Injection.

1600 Pick up labels from OFFICE MAX.

- make ship label + print.

- VOA - labels - fill out.

1700 END OF DAY



8 hr

46.00 pdion

5 Wed. 8/20/14

0700 Bristol on site. PS+W on site.

0730 Safety Meeting

- PS+W calc, INT. solutions

0810 Rob Rau (EPA) on site

- permits signed

- START WORK.

0830 START Decom @ EXIST MW.2 + MW1.

- David D. (EPA) on site.

0900 START INSTAL of New MW2B.

- Step out 1.5 ft to west of original mark for MW2B due to water line proxi.

0930 Wil + Brandon (VNE) on site.

0940 PS+W drill to 20' hgs.

- WATER @ 10' - 12' hgs

1000 Advance w/ 4" rod to Target depth. MW2B.

- instal screen + riser.

- Colorado Silica Sand.

1050 Surge wall using 1" PVC w/ Surge BLK.

Rite in the Rain



Wed. 8/20/14

- 1110 Complete Surge.  
 - Decon sub pump + PSTW will develop well.
- 1130 PSTW start develop well  
 - Calibrate YSI & Turb  
 see Cal log YSI #
- Rob Rau (EPA) off site
- 1200 David Domingo (EPA) off site
- 1205 start readings + develop MW2B  
 initial - water is very dirty
- 1300 All param stabilized  
 \* Water will NOT clear up.  
 Have taken 35 gal which is way more than required so will stop develop + let set awhile before sample. Per Rob Rau (EPA) + JSD (Bristol)
- Note: Per Rob Rau (EPA) + JSD (Bristol) if turbidity does not clear up after stabilization has been achieved go ahead & collect sample from MW2B.
- PSTW start deconish MW1

Wed. 8/20/14

- 1430 start pump for param + sample collection.  
 - param has stabilized but water still dirty.
- 1500 Collect samples @ MW2B
- 1600 = Dup of MW2B + Dup - MW2C.  
 + MS / MSD.
- 1545 start push rods for int.  
 @ IP1. ✓
- Note: Rob Rau (EPA) chose locations for 6 inj points + MW2B.
- 1550 start inj. IP1  
 25 gal of solution per ST.  
 $25 \text{ gal} \times 6 = 150 \text{ gal} \times 6 = 900 \text{ gal}$
- 1655 Complete FMT @ IP-1  
 - PSTW will start cleanup.
- 1730 All off site.
- 1800 Arrive Hotel + put samples in fridge.
- Dinner -
- 2000 Download Photos  
 - Complete Sample Label Time Date.
- 2030 End of day

8/20/14  
 Rite of the Rain

Thursday 8/21/14

0700 Bvictal on site

0730 PSTW on site

- Safety meeting.

→ PSTW crew will start mix solution for next IP & Finish Decomish of MW 1

0830 Bristol off site to pack & ship samples.

- Cooler ID - WG20140821

NOTE: Need Airway bill to ship coolers

1000 - Call JSD & she will set shipment up for Friday delivery.

- Back to hotel to drop off coolers.

- Back to site WG.

1030 IP 3 ✓ - Had resistance @ end of inj process.

- Lost about 10 gal before stopped & grouted immediately.

1100 START INJ @ IP 5 ✓

1240 START INJ @ IP 2 ✓

1400 complete inj IP 2, Growt.

→ Notes out of diesel - go get fuel for Drill Rig

Thursday 8/21/14

1410 START Drill @ IP 6 ✓

1420 START INJ @ IP 6

① Pump in 5 gal water to ~~IP 6~~ <sup>INJ</sup> point & lubricate system.

② START inj of mix.

Gauge - 20 to 60 psi.

→ 2 - 55 gal drums left on site.

1 - Purge water, est. 40 gal

1 - Soil cuttings from MW 2B <sup>PH</sup> & concrete MW 1 & 2

1520 complete inj @ IP 6.

pull rods, decoar & mix

LAST Batch of solution.

1540 START push rods @ IP 4.

1545 START INJ @ IP 4.

1645 finish INJ @ IP 4. ✓

- PSTW crew starts to tear down pump equip & decoar

- Pull rods, patch IP 4.

1730 All off site.

1800 Arrive Hotel

- Download pics

- Sample Management - cooler to fridge

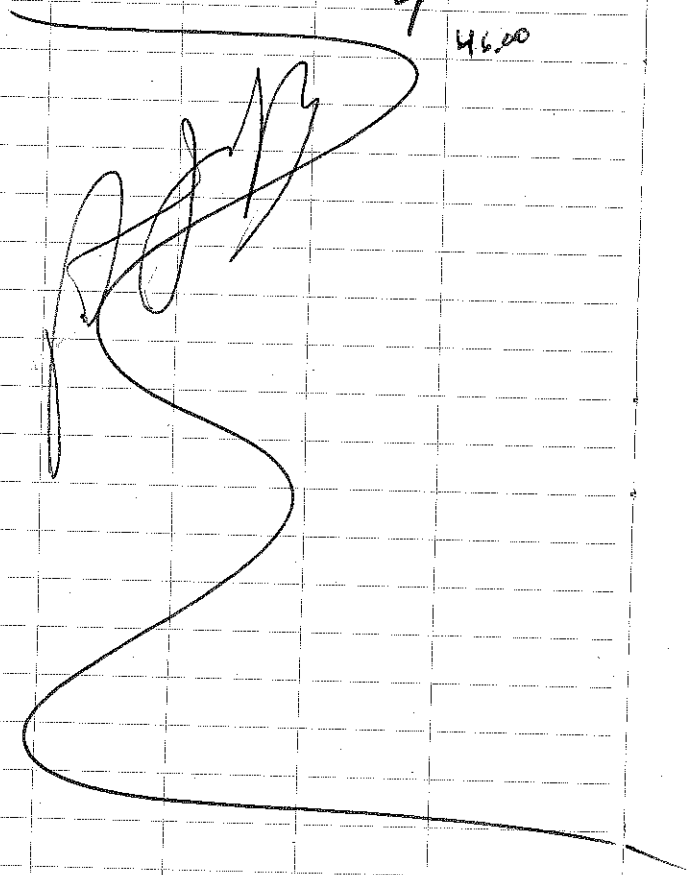
CC - chang & print, etc

*Rite in the Rain*

Thursday 8/21/14  
1900 End of Day

84

46.00



Friday 8/22/14

0730 re-pack sample cooler

- Load Gear

0800 Leave Hotel

- Fuel up Rental car

- Go To AK Cargo

0900 AT AK Cargo

1055 Depart for SEATAC

1130 Arrive SEATAC

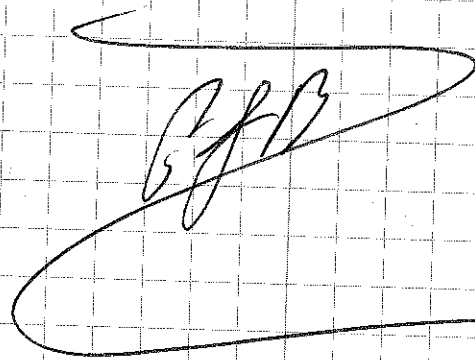
1700 Depart for ANC

2030 Arrive ANC

- Pick up Gear

- Taxi to Office & unload Gear.

2100 End of Day



## GROUNDWATER SAMPLING REPORT

CLIENT: EPASITE: WESTERN GASDATE: 8/20/14MONITORING WELL ID: MW2BSHEET 1 OF 1

1 in = 0.083 ft; 2 in = 0.167 ft; 3 in = 0.25 ft; 4 in = 0.333 ft

SAMPLER(S) NAME: PLBWEATHER: Sunny, 87°FSAMPLE ID ON COC: WG-MW2B20140820PURGE METHOD: PENSAMPLE METHOD: Peri GrabPRODUCT PRESENT: NOWATER LEVEL MEASURING DEVICE: IPTYPE OF PUMP: Peri Geo PumpWELL INTEGRITY: newREQUIRED REPAIRS: NOPUMP INTAKE DEPTH: 12.9 - 13.0DIAMETER OF WELL: 2" 0.167 (FT)RADIUS OF WELL (R): 0.167 (FT)TOTAL DEPTH OF WELL BELOW MEASURING POINT (D): 18.4 (FT)DEPTH TO GW BELOW MEASURING POINT (d): 10.9 (FT)LENGTH OF WATER COLUMN (L): (D-d)= 7.5 (FT)VOLUME OF WATER COLUMN (V): (3.14xRxRxL) 0.6567 (CUBIC FT)WELL VOLUME: (7.48xV)= 4.90 (GAL) X 3= 14.72 (GAL)

Min Purge Volume

Max Purge Volume

Note: Groundwater volumes above were calculated in the field and used for approximate purge volumes; rounded values are shown for informational purposes only.

TIME	VOLUME (GAL)	WATER LEVEL (ft BTOC)	pH	TEMP (deg C)	ORP (mV)	DO <del>mg/L</del> %	SPECIFIC COND. (uS/cm)	TURBIDITY (NTU)	VISUAL APPEARANCE OF WATER	STABILIZATION ACHIEVED (YES/NO) <sup>(1)</sup>
1430	12.9	10.9	7.40	18.71	-269.6	32.5	0.387	1000	Dirty	N
1433	1/8	10.9	7.39	18.84	-273.3	23.9	0.386	1000	"	N
1436	1/4	10.9	7.44	18.53	-272.2	21.5	0.386	898	"	N
1440	1/2	10.9	7.47	18.31	-277.5	21.0	0.386	787	"	N
1445	3/4	10.9	7.54	18.25	-177.9	16.8	0.387	704	"	N
1450	1.0	10.9	7.53	18.15	-185.6	16.4	0.388	685	"	N
1455	1.25	10.9	7.49	18.12	-193.5	15.7	0.388	660	"	N
1458	1.5	10.9	7.45	18.10	-200.1	15.4	0.387	634	"	N
1500	1.75	10.9	7.40	18.05	-208.7	14.1	0.389	611	"	N
Sample 1500										

(1) STABILIZATION is achieved when three (3) consecutive readings of field indicator parameters collected in 3 to 5 minute intervals meet the following criteria:

- ±0.1 standard units for pH
- ±10% for temperature
- ±3% for specific conductance (conductivity)
- ±10 mV for ORP or ±10% if between -100 mV and +100 mV
- ±10% for DO > 0.50 mg/L. Three DO readings < 0.50 mg/L can be considered stable.
- ±10% for turbidity > 10 ntu. Three turbidity readings < 10 NTU can be considered stable.

Purge Until All Parameters Stabilize or after 3 Well Volumes Are Removed for Low-Flow Minimal Drawdown Procedure

TOTAL VOLUME PURGED: (GAL)

FLOW RATE (desired range is 100 to 500 mL/min):

SAMPLE TIME: 1500 = Primary MS/MSD - 1600 DupQC SAMPLES COLLECTED: Primary = MW2B + MS/MSD, Dup = MW2C @ 1600

FIELD TESTS: Mn2+ =

Fe2+ =

Sulfide =

ANALYSIS (fill in correct method if not provided and the number of bottles collected for each parameter)

VOCs (in water) by SW8260B

Lead by SW6010B or SW6020

Sulfate by E300.0

BTEX only by SW8260B

TOC by SW9020

Chloride by E300.0

PAHs by SW8270C SIM

DOC by SW9020

Nitrate/Nitrite by E353.1

NWTPH Gx GRO by AK101 12

MEE by RSK-175 or Lab SOP

Other (Specify)

NWTPH Dx DRO by AK102 8

Alkalinity by E310.1

Other (Specify)

COMMENTS:

- Excellent Recharge

- WATER Dirty but should settle w/time, weather - 86°F, Sunny, 26% Humidity, 6 mph Wind NNW.

Stability criteria and purging criteria established by EPA Low-flow (Minimal Drawdown) Ground-water Sampling Procedures, Robert W. Puls and Michael J. Barcelona, EPA/540/S-95/504, April 1996.

# Bristol



ENVIRONMENTAL  
REMEDIALATION SERVICES, LLC

DTW 11.4 BTOC  
TD 28.85 BTOC

TOL 1.5' AGS

## WELL DEVELOPMENT FORM

Project: 34150026 Western GAS

Well No.: MW2B

Personnel: Bristol / PS&W

Development Method Sub Pump

Date: 8/20/14

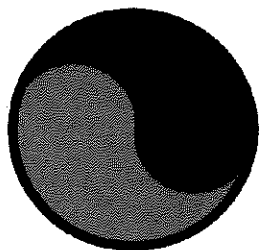
Time	Depth to Water (ft.)	Gallons Removed	Turbidity (Ntu)	pH	Temp (°C)	Dissolved Oxygen (mg/L) %	Specific Conductance (µs/cm)	Recovery Rate (Inches/min)	Recovery Rate (gpm)	Observations
1205	11.4	12	00R	8.36	30.08	37.0	0.554			Dirty Brn
1210	11.4	13	00R	8.22	21.15	36.4	0.534			11
1215	11.4	14	00R	8.90	19.22	41.4	0.541			11
1225	11.5	15	00R	6.77	19.90	22.2	0.457			Clearing / CLAY TAN
1240	11.5	20	1000	8.00	18.63	40.5	0.454			11
1245	11.5	24	1000	9.22	18.02	40.3	0.454			11
1250	11.5	30	1000	8.66	19.20	39.8	0.443			Dirty Brn
1300	11.5	35	1000	8.86	20.96	37.7	0.448			
STOP - WATER still dirty										

Switch  
to Sub  
Pump

Total Gallons Removed

35

- \* 12 gal removed w/sub pump before start readings - Dirty Water.
- \* Peri Pump used to fin develop + for readings.
- \* PVC TOC is 1.5 AGS. ★ DTW HAS been adjusted.



# Pacific Soil & Water – Daily Report

9790 SW Pembroke St. Tigard, OR 97224 (503)995-4463 Fax (503)486-5589

Date: 8/20/11	Client: BATES HILL
Project #: 34150026 WESTERN GAS	Project Mgr: JIMIE SHARP-TAHL
Site Address: 401 SE 14th St. Tippinish, WASH	On Site: 7:15A
	Off Site: 5:15P 110-60

Boring/ Well ID	Total Depth	Description of Work
		SAFETY MEETING
MW-2	12.4	BACKFILL MW-2 ? MW-1, ? Bust out VAULT ON MW-2 ? PATCH W/ CONCRETE
		MC-0-20, soil - cut cost for VAULT ? RUM
MW-2B	18.5'	3.5" Rods 0-18.8' INSTALL 2" pre-pack WELL,
		(10/45A-1:15) DEVELOPE ? PUMP WELL for sample.
		1:15-3:00P pump ? sample NEW WELL.
IP-1		PUSH 1.5" Rods TO 18' ? INSERT 150 GALL OF ORC, PART A- PART B. IN IP-1
Well Materials	3/4"	1" 2" IDW Drums 2 Standby Crew
Riser		Concrete Core Overnight
Screen / Pre-pack		Hand Sampling Weekend

Additional Materials / Comments:


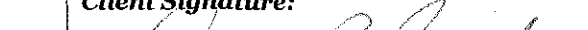
Driller Signature:

Bob Wright

Client Signature:

Jimie Sharp-Tahl

<b>Date:</b> 8/21/14	<b>Client:</b> Bristol
<b>Project #:</b> 34150026 WESTERN GAS	<b>Project Mgr:</b> JULIE SHARP-TALL
<b>Site Address:</b> 401.562nd St. TAPPING ST. - WASH	<b>On Site:</b> 7:15 A
	<b>Off Site:</b> 530P

<b>Driller Signature:</b> 	<b>Client Signature:</b> 
---	--

Each Field Team member will sign this section after site-specific training is completed and before being permitted to work on site.

I have read and reviewed the Site Safety and Health Plan and understand the information presented. I will comply with the provisions contained therein.

[illegible]



# DAILY SAFETY MEETING SHEET

Each crew member must sign and date the following form to document attendance at the safety meeting.

[illegible]

# Bristol



ENVIRONMENTAL  
REMEDIAL SERVICES, LLC

## Equipment Operator's Checklist

Company: Pacific Soil & Water Operator: BRAD WRIGHT Date: 8/20/14  
Equipment Type: AMS power probe Model: 9500 VTR

Equipment Items	Good Condition	Needs Attention	Notes:
Steering Brakes	✓		
Wheels, Tires, Tracks	✓		BRAND NEW TRACKS
Horn, Back-up Alarm	✓		
Seatbelt, Safety device	N/A		
Roll over Protection	✓		
Fire Extinguisher	✓		
Equip. Maintenance	✓		
Any Other Deficiency			

## Site Work Inspection

Site Work Inspection	None	Yes	Notes:
Material Obstructions	N/A		
Slip, Trip, & Fall Def.	Y		
Ruts, Holes, Hazards	N/A		
Barricades / Perimeter	N/Y		SEE SITE MAP / SAFETY CONES
Trenches/Excavations	N		
Overhead Power lines			
Traffic Exposures	Y		Vehicle & Pedest.
Any Other Deficiency			

### Safety Comments:

Active Fueling & CONVEINENT STORE.  
Vehicle & Pedestrian Activity esp. @ lunch.  
SITE VISITORS.

Signature: Brad Wright

Date: 8/20/2014

AMS 9500 VTR  
Direct Push

# Standard Equipment Inspection Form

Equipment No.	Date	Inspector Name	Hours	Location
	8/20/14	Brad Wright		Toppenish WA

## A. SERVICE CHECKS:

ITEM	OK	AMT NEEDED	ITEM	OK	AMT ADDED
Radiator & Freeze Protection	OK		Batteries	OK	
Engine	✓		Lubrication Points	OK	
Transmission	✓		Fuel Level	OK	
Hydraulic System	✓		Drain Fuel Sediment	OK	
Differentials	✓		Pivot Shaft	OK	
Planetaries / Final Drives	✓		Air Induction & Filter	OK	

## B. EQUIPMENT INSPECTION

	CONDITION Bad/Good/ Excellent	Attn Needed	Explanation	Corrected? (Y/N)
Fan & Shrouds	✓			
Belts Pulleys	✓			
Exhaust & Rain Cap	✓			
Battery & Cables	✓			
Hydraulic Cylinders	✓			
Operators Compartment	✓			
Hoses & Lines	✓			
Fuel / Oil Leaks	✓			
Cracks	✓			
Cutting Edges	✓			
Sprockets	✓			
Rollers & Idlers	✓			
Tracks or Tires	✓			
Trans Operation	✓			
Service Brakes	✓			
Parking Brake	✓			
Gauges Operational	✓			
Backup Alarm	✓			
Wipers & Washer	✓			
Lights	✓			
Horn	✓			
Seat & Seat Belts	✓			
Windows	✓			
Machine Damage:				

## Standard Equipment Inspection Form

NOTES (continued):

Deficiencies noted:

☐ Yes

☐ No

Explain:

N/A

Deficiencies fixed:

☒ Yes

☐ No

N/A

Date:

8/20/14

Inspection 100% complete

☒ Yes

☐ No

EPA Rep. Signature

Date all items passed inspection:

8/20/14

Bristol Representative

*Paul J. Bradley*

Date:

8/20/14

## **ATTACHMENT 4**

Permits

# YAKAMA NATION WATER CODE ADMINISTRATION

## APPLICATION INTERIM HYDRAULIC PERMIT

**FOR OFFICE USE ONLY**			
DATE RECEIVED		PERMIT CLASS	
APPLICATION NUMBER		Fee	\$350.00 per site

\*Payment is due upon application submission

### SECTION I

#### APPLICANT/CONTACT INFORMATION

Applicant Name	U.S. Environmental Protection Agency		
Contact Person	Rob Rau		
Mailing Address	US EPA Region 10 1200 6th Ave, Suite 900 OCE082 Seattle, WA 98101		
	Contractor: Bristol Environmental Remediation Services, LLC POC Julie Sharp-Dahl (907) 563-0013 111 W 16th Ave, Third Floor Anchorage, AK 99501		
E-Mail Address	rob.rau@epa.gov		
Phone	Work	206-553-6285	Home
	Cell	206-458-8301	Message

### SECTION II

#### PROPOSAL

1) Location of Proposed Activity (Legal description):	401 South Elm St, Toppenish, WA
Attach A Map Indicating the Location of the Affected Area On the Reservation. The Map Must Show Sufficient Detail For An Inspector To Locate the Site.	
2) Affected Body of Water:	None known
3) Proposed Activity:	Installation of 6 geoprobe borings to 18 feet below ground surface (bgs), and injection of Regenesix's remediation products (RegenOx plus ORC-Advanced) into the contaminated zone. All six borings will be used for injection. The treatment zone will be from 12-18 feet bgs.
The first treatment under this hydraulic permit will take place in mid-August 2014. Additional treatments may take place in the future.	
Additional site work to be conducted in August 2014 includes decommissioning of 2 onsite groundwater monitoring wells and installation of one new well. Groundwater monitoring Well Decommissioning and Well Installation permits accompany this application.	
4) List Any Environmental Information That Has Been Prepared, Or Will Be Prepared, Directly Relating to This Proposal:	
There are a number of previous reports for this site, which are referenced in the Corrective Action Plan provided to the Yakama Water Code Administration (Mark Koffler) on July 18, 2013.	
The Corrective Action Report detailing the activities conducted during the first round of treatment was provided to Mr. Koffler on November 5, 2013.	
After the completion of the remedial treatment a report will be drafted and submitted to the EPA, Yakama Environmental Program and the Yakama Water Code Administration.	

◀ **SECTION III** ▶  
**IMPACTS**

5) List and Describe All Anticipated Impacts Identified From Environmental Impacts Checklist. If Checklist Is Not Used Identify All Impacts Here:	
Soils	<p>RegenOx is a remediation product that directly destroys contaminants through oxidation reactions. RegenOx is a two-part product consisting of an oxidizer and an activator, which are combined and then injected into the contaminated media (in either the saturated or vadose zone). RegenOx includes a sodium percarbonate complex with a multi-part catalytic formula, and can quickly destroy petroleum hydrocarbon and associated VOC contaminants through a chain of oxidation reactions.</p> <p>ORC Advanced is a remediation product that accelerates naturally occurring aerobic bioremediation by supplying oxygen to the contaminated media.</p> <p>IDW soil from soil borings will be disposed of off-site, and the borings filled with benonite. Filled borings will be paved over.</p>
Water	None. The chemical reaction that is produced is relatively safe, as the chemicals are non-corrosive and generate minimal amounts of heat and pressure. Borings will be filled with bentonite to prevent a preferential pathway for contaminants to groundwater. Filled borings will be paved over.
Air	None. The primary contaminant of concern is weathered gasoline.
Fisheries & Wildlife	None. Work to be conducted in the town of Toppenish.
Vegetation	None. Site is a paved parking lot surrounded by commercial establishments.
Cultural Preservation	None known. Site is well developed; site has supported a number of businesses in the past.
Miscellaneous	None known
Other	Potential impacts may include temporary inconvenience to the active Western Gas station due to the need to install borings; coordination will be made with the station operator.

◀ **SECTION IV** ▶  
**MITIGATION**

6) Proposed Mitigation: List Mitigation Measures For Each of the Impacts Identified In Section III Above. Attach Additional Sheets For Description As Necessary:	
Bristol will coordinate with the property owner to ensure the proposed boring locations are free of cars and other objects that may impede the site assessment.	
Utilities will be located prior to performing any intrusive work.	
7) Proposed Project Abandonment Procedures:	
Borings will be filled with bentonite and paved over. All investigation derived waste will be removed from the site and properly disposed of.	

## ◀ SECTION V ▶

## 8) Verification:

I verify that the information provided in this application is complete and true to the best of my knowledge.

Lawrence Nelson      7/3/14  
Legal Property Owner Signature      Date

John Shays-Dun      7/2/14  
Applicant Signature      Date

**NOTE:**

- Yakama Nation water use permits do not create exemptions from Wapato Irrigation Project O&M Charges.
- This application will be processed in accordance with Yakama Nation Water Code Title 60; Chapter 61.01 of the Hydraulic Code.

▪YN Water Code Administration▪

▪P.O. Box 151, Toppenish, WA.98948▪214 Ivy Street, Wapato, WA. 98951▪Phone (509) 865-5121 ext. 6122/6125▪

Revised:10-07-2010.mrs





# YAKAMA NATION WATER CODE ADMINISTRATION

## APPLICATION CLASS 10 TEMPORARY/MONITORING WELL

FOR OFFICE USE ONLY			
DATE RECEIVED		PERMIT CLASS	
APPLICATION NUMBER		FEE	\$300.00 + \$100.00 per monitor well

### ◀ SECTION I ▶

APPLICANT NAME	U.S. Environmental Protection Agency		
CONTACT PERSON	Rob Rau		
MAILING ADDRESS	US EPA Region 10 1200 6th Ave. Suite 900 OCE082 Seattle, WA 98101		
	Contractor: Bristol Environmental Remediation Services, LLC POC Julie Sharp-Dahl (907) 563-0013 111 W 16th Ave. Third Floor Anchorage, AK 99501		
PHONE NUMBERS	BUSINESS	206-553-6285	
	HOME		
	CELL	206-458-8301	

1) Diameter and Depth of Well	2-inch prepack well, 19 feet deep with 10 feet of screen.		
2) Describe the system installed:	Groundwater monitoring well		
3) Well Driller's Name, License No., Address & Phone Number (Must Be Licensed With Washington State and Yakama Nation):			
Pacific Soil and Water, Inc.	UBI# 603 112 952	WA State Driller Lic# 3040, 3053, 3062	
9790 SW Pembroke St.	L&I# PACIFSW899MK	EIN# 45-0983927	
Tigard, OR 97224	PH# 503-995-4463		
PS&W and Bristol have both applied for a business license to conduct work on the Yakama Nation, and will provide the license number to the Water Code Administration by email to Brittany Contreras upon receipt.			

### ◀ SECTION II ▶

4) Existing Water Uses	Primary	None known. City supplies water
	Secondary	None known.
	Other	None known
5) Quantity of Water Used	Gallons Per Minute	Not Applicable (NA) - This is not a drinking or irrigation water well
	Acre Feet Per Year	NA
6) Pump Type and Capacity	NA	
6a) Motor Type Capacity, Horsepower (electric, propane, diesel)	NA	
6b) Depth Of Pump Below Ground Surface	NA	
6c) Approximate Depth Of Pump Below Water Table	NA	
6d) Depth Of Well	19 feet bgs	

◀ SECTION III ▶

7) When Is Well Water In Use (monthly, temperature, etc.)	Samples are collected as specified by EPA. Immediately after installation this well will be sampled (mid-August 2014).
7b) Is Water From An Irrigation Project Or Other Wells Applied Or Available To This Acreage? Explain	
NA	
8) Total Number Of Acres Covered By Water From This Well?	NA
9) Acre Breakdown Of the Type and Variety Of Crops? (i.e., 20ac concord grapes, 15ac red chief apples, 10ac gala apples, 25ac hops)	NA
10) Location Of Property	401 S. Elm St. Toppenish, WA

11) Status Of Land:	Trust Land/Allotment No.:	NA
	Deeded Or Fee Land-Yakima County Parcel No.:	201009-12421

12) Legal Description Of Property:	401 S Elm St. Toppenish, WA
13) Attach An Irrigation Project Photo Or Topographic Map Indicating Location Of Property, Location Of the Well, Boundaries Of Area On Property where Water Is Used, and All Existing Wells Or Waterworks On the Property?	

NA	
14) Describe All Surface Water Bodies Within One Mile of the Proposed Well Location (canals, rivers, gravel pits)	None known.
15) Are You the Property Owner?	No.
15a) If You Are Not the Owner, What Is Your Interest in the Property?	
The EPA is remediating the site under the LUST Trust Program.	
15b) Please List the Name and Address of the Owner	Praveen Dewan 401 S. Elm St. Toppenish, WA
16) Is All Water Used On the Property Listed Above?	NA
If Not, Attach Map Indicating Location Where Water	NA
17) What Additional Water Rights Do You Have Or Want Attach To the Property?	NA
18) Do Existing Wells Now Serve the Property? If Yes, How Many?	NA
List Size, Depth and Usage for Each Existing Well (attach a map and mark the location of each existing well)	NA
19) Have Any of the Following Agencies Issued A Permit For This Project? If So, Please List Permit # And Date of Issuance:	
Indian Health Services	No
Washington State Dept. of Ecology	No
Other	No. However, EPA is also applying for the decommissioning permit and the hydraulic permit to be used at this site – see details on those permit applicaitons.

## ◀SECTION IV▶

## 20) Verification:

I verify that the information provided above is complete and true to the best of my knowledge.

Legal Property Owner:

Praveen Dewan

Date:

7/3/14

Applicant:

Janie Sharp Dwyer

Date:

7/2/14

## NOTE:

• Yakama Nation reserves the right to impose a fee for the use of its water resources. The non-refundable fee is used to lessen the costs incurred by the Yakama Nation in filing and processing applications. The permit constitutes a temporary 10 year revocable license and will expire ten years from date application is received.

• If construction proposed in this application involves work within 200 feet of a surface water body, including streams, rivers, lakes, and ponds, you must obtain a Yakama Nation Hydraulic Permit. Water quality standards also apply.

• In accordance with Yakama Nation Water Code Chapter 60.09 Water Use Permits, Section 60.09.07 Groundwater Withdrawal Permits (2) Class 4: Domestic Use Permit.

- All persons drilling wells on the Yakama Reservation must be licensed by Yakama Nation and the State of Washington in accordance with WAC Chapter 173-162 (effective 8/11/89), and must adhere to the construction standards found in WAC Chapter 173-160 (effective 5/5/88).
  - Yakama Nation Water Use Permits do not create exemptions from Wapato Irrigation Project O&M Charges.
  - When permit approved it grants the use of the water of the Yakama Nation and does not establish or embody a water right or result in the relinquishment of any interest of the Yakama Nation in its water resource.
- YN Water Code Administration• P.O. Box 151, Toppenish, WA.98948•Phone (509) 865-5121/(509) 877-7684•Fax (509) 877-1064•



# YAKAMA NATION WATER CODE ADMINISTRATION

## APPLICATION DECOMMISSION

FOR OFFICE USE ONLY			
DATE RECEIVED		PERMIT CLASS	
APPLICATION NUMBER		FEE	\$ 50.00

### ◀ SECTION I ▶

APPLICANT NAME	U.S. Environmental Protection Agency		
CONTACT PERSON	Rob Rau		
MAILING ADDRESS	US EPA Region 10		
	1200 6th Ave. Suite 900		
	OCE082		
	Seattle, WA 98101		
	Email: rob.rau@epa.gov		
PHONE NUMBERS	BUSINESS	206-553-6285	
	HOME		
	CELL	206-458-8301	

### ◀ SECTION II ▶

1) Diameter and Depth Of Well To Be Decommissioned, Reason For Decommissioning:	
There are currently two, 4-inch diameter PVC monitoring wells on site (MW-1 and MW-2) that are old and in poor condition, and the EPA believes these wells are no longer capable of providing representative groundwater samples. Each of these existing wells to be abandoned are to be flush mounted and approximately 16 feet deep.	
2) Location Of Well (parcel number or legal description):	401 South Elm St, Toppenish, WA
3) Well Driller's Name, License No., Address & Phone Number (Must Be Licensed With Washington State and Yakama Nation):	
Pacific Soil and Water, Inc. (PS&W). The driller who will be onsite conducting the work has not been identified as it will depend on the work PS&W picks up between now and mid-August. The driller will be determined early August prior to conducting the work.	
PS&W and Bristol have both applied for a business license to conduct work on the Yakama Nation, and will provide the license number to the Water Code Administration by email to Brittany Contreras upon receipt.	
Pacific Soil and Water, Inc. - 9790 SW Pembroke St - Tigard, OR PH# 503-995-4463	
UBI# 603 112 952 L&# PACISW889MK EIN# 45-0983927 WA State Driller Lic# 3040, 3053, 3062	

## ◀ SECTION III ▶

4) Are You the Property Owner?	YES	<input checked="" type="checkbox"/> NO	X If Not the Owner, List Name & Address Of Owner
Praveen Dewan, 401 S Elm St, Toppenish, WA			
If You Are Not the Owner, What Is Your Interest In the Property?	U.S. Environmental Protection Agency (EPA)		
	The EPA is remediating the site under the LUST Trust Program		

## ◀ SECTION IV ▶

## 5) Verification:

I verify that the information provided above is complete and true to the best of my knowledge.

LEGAL PROPERTY OWNER:

Praveen Dewan

DATE:

7/3/2014

APPLICANT:

Jim Sharp-Dan

DATE:

7/2/14

## NOTE:

- Yakama Nation reserves the right to impose a fee for the use of its water resources. The non-refundable fee is used to lessen the costs incurred by the Yakama Nation in filing and processing applications. The permit constitutes a temporary 10 year revocable license and will expire ten years from date application is received.
- If construction proposed in this application involves work within 200 feet of a surface water body, including streams, rivers, lakes, and ponds, you must obtain a Yakama Nation Hydraulic Permit. Water quality standards also apply.
- In accordance with Yakama Nation Water Code Chapter 60.09 Water Use Permits, Section 60.09.07 Groundwater Withdrawal Permits (2) Class 4: Domestic Use Permit.
- All persons drilling wells on the Yakama Reservation must be licensed by Yakama Nation and the State of Washington in accordance with WAC Chapter 173-162 (effective 8/11/89), and must adhere to the construction standards found in WAC Chapter 173-160 (effective 5/5/88).
- Yakama Nation Water Use Permits do not create exemptions from Wapato Irrigation Project O&M Charges.
- When permit approved it grants the use of the water of the Yakama Nation and does not establish or embody a water right or result in the relinquishment of any interest of the Yakama Nation in its water resource.

•YN Water Code Administration• P.O. Box 151, Toppenish, WA 98948 • 214 Ivy Street, Wapato, WA. 98951•Phone (509) 865-5121/(509) 877-7684•Fax (509) 877-1064•



Confederated Tribes and Bands  
of the Yakama Nation

Established by the  
Treaty of June 9, 1855

**YAKAMA NATION**  
**WATER CODE ADMINISTRATION**  
**CLASS 9 MONITOR WELL PERMIT**  
**#T9-2013-04**

**Details of Application:**

Date of Application: July 7, 2014  
Applicant Name: **U.S. Environmental Protection Agency**  
Contact Person: Rob Rau  
Mailing Address: U.S. EPA Region 10  
1200 6<sup>th</sup> Ave. Suite 900  
OCE082  
Seattle, WA 98101

Contractor: Bristol Environmental Remediation Services, LLC  
POC Julie Sharp-Dahl (907)563-0013  
111 W 16<sup>th</sup> Ave. Third Floor  
Anchorage, AK 99501  
Phone Number(s): Work: (206)553-6285  
Cell: (206)458-8301

**Purpose, Proposed Use and Permit Time Period:**

Permittee, U.S. Environmental Protection Agency via Rob Rau is requesting to decommission two 4" x 16' PVC monitoring wells and installation of one 2" x 19' with 10 feet of screen temporary monitor well on Deeded land/ Parcel No. 201009-12421 in Section 09, Township 10N, Range 20E.

The primary purpose of the monitor well being installed is to retrieve soil samples for potential petroleum contaminants.

**The use is scheduled to begin immediately after installation. This well will be sampled (mid-August 2014). Use of the monitor wells will be determined based on the needs of the Environmental Protection Agency.**

The existing wells on the property shall be decommissioned in accordance with Part One in Chapter 173-160 WCA. A variance of the decommissioning method may be approved by the Water Code Administration if appropriate. It is the responsibility of the driller and the well owner to insure that well decommissioning is completed. **Failure to do so can result in civil fines, revocation or denial of any**



further drilling activities within the exterior boundaries of the Yakama Nation until the terms of the permit conditions are met.

### **Provisions:**

Water Withdrawal is approved and subject to the following provisions:

1. This permit grants permission for the time period listed to temporarily use water in Section 09, Township 10N, Range 20E. **The use of water from these wells will be for testing and sampling.** *The requested 2" x 19" temporary monitor wells must be conducted with a **licensed driller** in accordance with Chapter 60.11 of the Yakama Nation Water Code and must be licensed with the Yakama Nation. (The same described in Washington Administrative Code Chapter 173-162).*
2. The replaced monitor wells shall be decommissioned immediately upon completion of the new monitor well. A variance from the WAC code may be granted by the Water Code Administration if warranted. **Please contact the Water Code Administration to discuss this process. If these procedures are not followed fines and punitive measures will apply.**
3. The Yakama Nation Water Code REQUIRES a written 72-hour notification prior to ANY drilling activity. Do so by completing a 72-hour notification form and fax to (509)877-1064 or mail to P.O. Box 151, Toppenish WA 98948. Verbal communications will be considered void. **The applicant is responsible to supply driller with a copy of this permit and the driller must have a copy of the permit on the job site at all times.**
4. The exact location of the site is listed as being in Section 09, Township 10N, Range 20E, Quarter NE: LOT 1 SP 7283340.
5. The Yakama Nation retains the authority to order the applicant to cease water withdrawal if it threatens or has some adverse effect on the health, safety, or welfare of the Yakama Nation and its members. All best management safety practices shall be employed during these work activities.
6. If water quality tests are conducted on waters from this well, a copy of the test results will be submitted to the Water Code Office within 30 days of receipt results.
7. A copy of all data results from the permitted monitor wells will be submitted to the Water Code office and the Roads, Irrigation and Land Committee annually on December 31<sup>st</sup> of each year.
8. **Permittee is to have spill kits available on all water pumps when using permitted sites.**
9. When necessary, permittee shall place traffic signs at water site for safety of traffic in the area.
10. *This permit does not authorize trespass. It is the permittee's responsibility to obtain written permission to enter property owned by others.*
11. **The Water Code administration requests a timeline for use and final decommissioning of these monitor wells. The user shall give a 72 hour notice prior to decommissioning of the monitor wells.**

***Failure to comply with the terms, conditions, and scope of this permit may result in the cancellation of this permit and/or civil penalties as listed in the YN Law and Order Code Title 60. This Class 9 Temporary Monitor Well permit is to be available on the job site at all times and its provisions followed by the permittee and operator performing the work.***

***I have read, understand and will comply with the conditions of this permit. Noncompliance can result in civil fines, requests to cease and desist and denial of permit.***

**Applicant Initial** RR.

This withdrawal permit is issued based on the assumption that no significant impacts to water resources are anticipated as a result of this project. This permit is revocable if the Water Code Administration determines that significant impacts to water quality, quantity, channels, fish habitat, or riparian conditions are occurring or have occurred.

This permit constitutes a temporary revocable license to perform work within and adjacent to surface waters of the Yakama Nation. The Yakama Nation does not have water surplus or excess to its needs. It does not establish or embody a water right or result in the relinquishment of any interest the Yakama Nation has in its water resources.

Failure to comply with the terms, conditions, and scope of this permit or the provisions of the Yakama Nation Water Code may result in the cancellation of this permit. This Class 9 Temporary Surface Water Withdrawal permit approval is to be available on the job site at all times and its provisions followed by the permittee and operator performing the work.

**Rationale for the Decision: T9-2014-07**

In judgment at this time, the Class 9 Temporary Surface Withdrawal Permit proposed under this permit represents and environmentally sound activity. In arriving at this decision, the environmental consequences of the proposed water use seem minimal.

***Please read carefully, sign and date this agreement. Your signature indicates that you understand and agree to the conditions set forth in this permit agreement. Project activities may commence when this permit is signed and a 72-hour notice is given.***


**YN Water Code Director**

X   
Director

**Date** 08-19-2014

***I have read the foregoing permit information and agree to comply with all the conditions set forth in the permit in exchange for the YN permission to drill.***

**Permit Applicant**

X   
Applicant

**Date** 08-20-2014



Confederated Tribes and Bands  
of the Yakama Nation

Established by the  
Treaty of June 9, 1855

**YAKAMA NATION  
WATER CODE ADMINISTRATION  
HYDRAULIC INTERIM  
#H-2014-13**

**Details of Application:**

Date of Application:	July 7, 2014
Applicant Name:	<b>U.S. Environmental Protection Agency</b>
Contact Person:	Rob Rau
Mailing Address	US EPA Region 10 1200 6 <sup>th</sup> Ave, Suite 900 OCE082 Seattle, WA 98101
	Contractor: Bristol Environmental Remediation Services, LLC POC Julie Sharp-Dahl (907)563-0013 111 W 16 <sup>th</sup> Ave. Third Floor Anchorage, AK 99501
Phone:	Work: (206)553-6285 Cell: (206)458-8301

**Background:**

Application to the Yakama Nation Water Code Administration for a Hydraulic Project permit secures agreement by the applicant, U.S. Environmental Protection Agency that this permit is issued under the jurisdiction of the Yakama Nation.

**Note:** This **Hydraulic Project Approval** permit pertains only to the provisions of the Yakama Nation Hydraulic Code and Water Code. It is the permittee's responsibility to apply for and obtain any additional permits from other permitting agencies, State and Federal that may be necessary for this project.

**Proposed Activity:**

*This information is taken from the application submitted by U.S. Environmental Protection Services via Rob Rau.*

The proposed activity is installation of 6 geoprobe borings to 18 feet below ground surface (bgs), and injection of Regenesi's remediation products (RegenOx plus ORC-Advanced) into the contaminated zone.

All six borings will be used for injection. The treatment zone will be from 12-18 feet bgs.

The first treatment under this hydraulic permit will take place in mid-August 2014. Additional treatments may take place in the future.

Additional site work to be conducted in August 2014 includes decommissioning of 2 onsite groundwater monitoring wells and installation of one new well. Groundwater monitoring, well decommissioning and well installation permits accompany this application.

The project will be located at 401 South Elm Street, Toppenish, WA 98948.

### **Impacts:**

*Impacts listed on the permit application are as follows:*

<b>Soils:</b>	RegenOx is a remediation product that directly destroys contaminants through oxidation reactions. RegenOx is a two-part product consisting of an oxidizer and an activator, which are combined and then injected into the contaminated media (in either the saturated or vadose zone). RegenOx includes a sodium percarbonate complex with a multi-part catalytic formula, and can quickly destroy petroleum hydrocarbon and associated VOC contaminants through a chain of oxidation reactions.
	ORC Advanced is a remediation product that accelerates naturally occurring aerobic bioremediation by supplying oxygen to the contaminated media.
	IDW soil from soil borings will be disposed of off-site, and the borings filled with bentonite. Filled borings will be paved over.
<b>Water:</b>	None. The chemical reaction that is produced is relatively safe, as the chemicals are non-corrosive and generate minimal amounts of heat and pressure. Borings will be filled with bentonite to prevent a preferential pathway for contaminants to groundwater. Filled borings will be paved over.
<b>Air:</b>	None. The primary contaminant of concern is weathered gasoline.
<b>Fisheries &amp; Wildlife:</b>	None. Work to be conducted in the town of Toppenish
<b>Vegetation:</b>	None. Site is a paved parking lot surrounded by commercial establishments.
<b>Cultural Preservation:</b>	None known. Site is well developed; site has supported a number of businesses in the past.
<b>Miscellaneous &amp; Other:</b>	Potential impacts may include temporary inconvenience to the active Western Gas station due to the need to install borings; coordination will be made with the station operator.

### **Mitigation:**

Bristol will coordinate with the property owner to ensure the proposed boring locations are free of cars and other objects that may impede the site assessment.

Utilities will be located prior to performing any intrusive work.

**Provisions:**

1. **NOTIFICATION REQUIREMENT:** The permittee or contractor shall notify the Water Code Administration of the project start date. Notification shall be received by the WCA at **least** three working days prior to the start of construction activities. The notification shall include the permittee's name, project location, starting date of work, and the permit number for the Hydraulic Project Approval.
2. No petroleum products, hydraulic fluid, chemicals, or any other toxic or deleterious materials shall enter or leak into the stream or other water source.
3. All waste material such as construction debris, silt, excess dirt or overburden resulting from the project shall be deposited above the limits of floodwater in an approved upland disposal site.
4. This HPA does not authorize trespass onto property not owned by the permittee. It is the permittee's responsibility to obtain permission to enter property owned by others.
5. This permit is valid for one year from the date of issue. All additional HPA work plans shall be cleared and approved through the Yakama Nation Water Code Administration prior to commencing any activities.

***Failure to comply with the terms, conditions, and scope of this permit may result in the cancellation of this permit and/or civil penalties as listed in the YN Law and Order Code Title 60. This Interim Hydraulic permit is to be available on the job site at all times and its provisions followed by the permittee and operator performing the work.***

***I have read, understand and will comply with the conditions of this permit. Noncompliance can result in civil fines, requests to cease and desist and denial of permit.***

**Applicant Initial** TRR.

**Rationale for the Decision: H-2014-13**

In arriving at this decision, I have reviewed the environmental consequences of the proposed Hydraulic Project. In my judgment, at this time, the Hydraulic Project proposed under this permit represents an environmentally sound activity.

***Please read carefully, sign and date this agreement. Your signature indicates that you understand and agree to the conditions set forth in this agreement. Project activities may commence when exact date is given, and sign and date this agreement.***

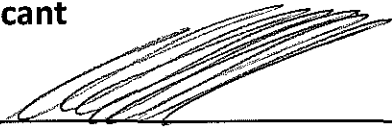
**Water Code Director**

X   
Director

Date 08-19-2014

***I have read the foregoing permit and agree to comply with all conditions and measures set forth, in exchange for the Yakama Nation's permission to proceed with maintenance hydraulic modifications.***

**Permit Applicant**

X   
Permit Applicant

Date 08-20-2014



**ATTACHMENT 5**

Laboratory Analytical Data Package

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Seattle  
5755 8th Street East  
Tacoma, WA 98424  
Tel: (253)922-2310

TestAmerica Job ID: 580-45065-1

Client Project/Site: Western Gas - Toppenish, WA

For:

Bristol Env. Remediation Services LLC  
111 W 16th Ave  
Suite 301  
Anchorage, Alaska 99501

Attn: Julie Sharp-Dahl



Authorized for release by:  
9/3/2014 3:53:05 PM

Melissa Armstrong, Project Manager II  
(253)248-4975  
[melissa.armstrong@testamericainc.com](mailto:melissa.armstrong@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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## Case Narrative

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

**Job ID: 580-45065-1**

**Laboratory: TestAmerica Seattle**

### Narrative

#### Receipt

The samples were received on 8/22/2014 5:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.1° C and 3.0° C.

#### Except:

The sample date on the Chain of Custody (COC) for the trip blank WG-TB-20140812 (580-45065-3) appears to be the date the vials were prepared by the Laboratory. The date typically used for the trip blank is that of the earliest sampling date that appears on the COC. The sampling date for WG-TB-20140812 (580-45065-3) has been changed to reflect the earliest sample date.

#### GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### GC Semi VOA - Method(s) NWTPH-Dx

For samples WG-MW-2B-20140820 (580-45065-1) and WG-MW-2C-20140820 (580-45065-2), the results in the #2 Diesel Fuel (C10-C24) ranges are due primarily to a weathered gasoline product. The affected analyte ranges have been "Y" qualified and reported.

The method blank 580-168203/1-A contained #2 Diesel Fuel (C10-C24) above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

## Definitions/Glossary

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

### Qualifiers

#### GC VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

#### GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
Y	The chromatographic response resembles a typical fuel pattern.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Client Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

**Client Sample ID: WG-MW-2B-20140820**

**Lab Sample ID: 580-45065-1**

**Date Collected: 08/20/14 15:00**

**Matrix: Water**

**Date Received: 08/22/14 17:15**

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	5.6		0.050	0.010	mg/L			09/02/14 23:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	130		50 - 150					09/02/14 23:11	1
Trifluorotoluene (Surr)	112		50 - 150					09/02/14 23:11	1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	1.4	B Y	0.13	0.020	mg/L		08/27/14 09:41	08/28/14 13:30	1
Motor Oil (>C24-C36)	0.096	J	0.27	0.031	mg/L		08/27/14 09:41	08/28/14 13:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		50 - 150				08/27/14 09:41	08/28/14 13:30	1



# Client Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

**Client Sample ID: WG-MW-2C-20140820**

**Lab Sample ID: 580-45065-2**

**Date Collected: 08/20/14 16:00**

**Matrix: Water**

**Date Received: 08/22/14 17:15**

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	5.6		0.050	0.010	mg/L			09/02/14 23:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	132		50 - 150					09/02/14 23:44	1
Trifluorotoluene (Surr)	109		50 - 150					09/02/14 23:44	1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	1.4	B Y	0.13	0.019	mg/L		08/27/14 09:41	08/28/14 14:17	1
Motor Oil (>C24-C36)	0.14	J	0.26	0.030	mg/L		08/27/14 09:41	08/28/14 14:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		50 - 150				08/27/14 09:41	08/28/14 14:17	1

## Client Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

**Client Sample ID: WG-TB-20140812**

**Lab Sample ID: 580-45065-3**

**Date Collected: 08/20/14 12:00**

**Matrix: Water**

**Date Received: 08/22/14 17:15**

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.050	0.010	mg/L			09/02/14 18:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		50 - 150					09/02/14 18:48	1
Trifluorotoluene (Surr)	114		50 - 150					09/02/14 18:48	1

# QC Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-168572/8

Matrix: Water

Analysis Batch: 168572

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.050	0.010	mg/L			09/02/14 17:43	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		50 - 150					09/02/14 17:43	1
Trifluorotoluene (Surr)	114		50 - 150					09/02/14 17:43	1

Lab Sample ID: LCS 580-168572/6

Matrix: Water

Analysis Batch: 168572

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1.00	0.899		mg/L		90	79 - 110
Surrogate	%Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	102		50 - 150				
Trifluorotoluene (Surr)	101		50 - 150				

Lab Sample ID: LCSD 580-168572/7

Matrix: Water

Analysis Batch: 168572

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1.00	0.890		mg/L		89	79 - 110	1	20
Surrogate	%Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	103		50 - 150						
Trifluorotoluene (Surr)	101		50 - 150						

Lab Sample ID: 580-45065-1 MS

Matrix: Water

Analysis Batch: 168572

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	5.6		1.16	6.70	4	mg/L		94	50 - 150
Surrogate	%Recovery	MS Qualifier	Limits						
4-Bromofluorobenzene (Surr)	137		50 - 150						
Trifluorotoluene (Surr)	114		50 - 150						

Lab Sample ID: 580-45065-1 MSD

Matrix: Water

Analysis Batch: 168572

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	5.6		1.16	7.00	4	mg/L		119	50 - 150	4	35

TestAmerica Seattle

# QC Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: 580-45065-1 MSD

Matrix: Water

Analysis Batch: 168572

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	140		50 - 150
Trifluorotoluene (Surr)	114		50 - 150

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-168203/1-A

Matrix: Water

Analysis Batch: 168295

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 168203

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.0464	J	0.13	0.019	mg/L		08/27/14 09:41	08/28/14 12:43	1
Motor Oil (>C24-C36)	ND		0.25	0.029	mg/L		08/27/14 09:41	08/28/14 12:43	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				08/27/14 09:41	08/28/14 12:43	1

Lab Sample ID: LCS 580-168203/2-A

Matrix: Water

Analysis Batch: 168295

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 168203

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	4.00	3.06		mg/L		77	59 - 120
Motor Oil (>C24-C36)	4.00	3.46		mg/L		86	71 - 140
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl	83		50 - 150				

Lab Sample ID: LCSD 580-168203/3-A

Matrix: Water

Analysis Batch: 168295

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 168203

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
#2 Diesel (C10-C24)	4.00	2.87		mg/L		72	59 - 120	6	27
Motor Oil (>C24-C36)	4.00	3.27		mg/L		82	71 - 140	6	27
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	77		50 - 150						

Lab Sample ID: 580-45065-1 MS

Matrix: Water

Analysis Batch: 168295

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Prep Batch: 168203

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	1.4	B Y	4.07	4.20		mg/L		68	59 - 120
Motor Oil (>C24-C36)	0.096	J	4.07	3.33		mg/L		79	71 - 140

TestAmerica Seattle

# QC Sample Results

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: 580-45065-1 MS

Matrix: Water

Analysis Batch: 168295

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Prep Batch: 168203

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	76		50 - 150

Lab Sample ID: 580-45065-1 MSD

Matrix: Water

Analysis Batch: 168295

Client Sample ID: WG-MW-2B-20140820

Prep Type: Total/NA

Prep Batch: 168203

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
#2 Diesel (C10-C24)	1.4	B Y	4.13	4.07		mg/L		64	59 - 120	3	27
Motor Oil (>C24-C36)	0.096	J	4.13	3.29		mg/L		77	71 - 140	1	27

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	76		50 - 150

## Lab Chronicle

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

**Client Sample ID: WG-MW-2B-20140820**

**Date Collected: 08/20/14 15:00**

**Date Received: 08/22/14 17:15**

**Lab Sample ID: 580-45065-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	NWTPH-Gx		1	168572	09/02/14 23:11	IWH	TAL SEA
Total/NA	Prep	3510C			168203	08/27/14 09:41	RBL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	168295	08/28/14 13:30	JJP	TAL SEA

**Client Sample ID: WG-MW-2C-20140820**

**Date Collected: 08/20/14 16:00**

**Date Received: 08/22/14 17:15**

**Lab Sample ID: 580-45065-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	NWTPH-Gx		1	168572	09/02/14 23:44	IWH	TAL SEA
Total/NA	Prep	3510C			168203	08/27/14 09:41	RBL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	168295	08/28/14 14:17	JJP	TAL SEA

**Client Sample ID: WG-TB-20140812**

**Date Collected: 08/20/14 12:00**

**Date Received: 08/22/14 17:15**

**Lab Sample ID: 580-45065-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	NWTPH-Gx		1	168572	09/02/14 18:48	IWH	TAL SEA

### Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310



## Certification Summary

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

### Laboratory: TestAmerica Seattle

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-15

## Sample Summary

Client: Bristol Env. Remediation Services LLC  
Project/Site: Western Gas - Toppenish, WA

TestAmerica Job ID: 580-45065-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-45065-1	WG-MW-2B-20140820	Water	08/20/14 15:00	08/22/14 17:15
580-45065-2	WG-MW-2C-20140820	Water	08/20/14 16:00	08/22/14 17:15
580-45065-3	WG-TB-20140812	Water	08/20/14 12:00	08/22/14 17:15

5755 8th Street East

phone 253.922.2310 fax 253.922.5047

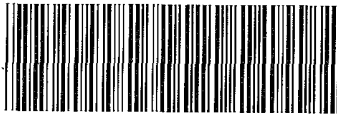
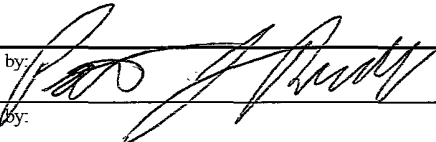
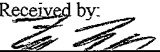
## TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

**TestAmerica Laboratories, Inc.**

9/3/20

Page 11 of 19

Client Contact		Project Manager: Julie Sharp-Dahl		Site Contact: Patrick Braley		Date: 8/22/14		Cooler ID: WG20140821	
Bristol Environmental Remediation Services, LLC		Tel/Fax: (907) 743-9394		Lab Contact: Melissa Armstrong		Carrier: AK Cargo		1 of 1 COCs	
111 W 16th Ave., Third Floor		Analysis Turnaround Time		<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Filtered Sample</div> <div> NWTPH_Gx (GRO)  NWTPH_Dx Extended (DRO/RRO) </div> </div>				Job No. 34150026	
Anchorage, Alaska 99501		SDG No.							
(907) 563-0013 Phone									
(907) 563-6713 Fax									
Project Name: Western Gas									
Site: Western Gas - Toppenish, WA.		Calendar (C) or Work Days (W) W							
P O # 34150026		TAT if different from Below STD							
		<input type="checkbox"/> 2 weeks							
		<input type="checkbox"/> 1 week							
		<input type="checkbox"/> 2 days							
		<input type="checkbox"/> 1 day							
Sample Identification		Sample Date	Sample Time	Sample Type	Matrix	# of Cont.			Sample Specific Notes:
WG-MW-2B-20140820	8/20/2014	1500	Grab	Water	5		X	X	
WG-MW-2B-20140820	8/20/2014	1500	Grab	Water	5		X	X	MS
WG-MW-2B-20140820	8/20/2014	1500	Grab	Water	5		X	X	MSD
WG-MW-2C-20140820	8/20/2014	1600	Grab	Water	5		X	X	
WG-TB-20140812	8/12/2014	1200	Grab	Water	3		X		
							 580-45065 Chain of Custody		
							2 of 2 Cooler/TB Dig/IR cor 3.0" unc 3.3" Cooler Dsc 1.1" Blue/1715 Lab 1715 Wet/Packs Packing Bubble w/CS AZ		
							1 of 2 Cooler/TB Dig/IR cor 1.1" unc 1.4" Cooler Dsc 1.1" Blue/1715 Lab 1715 Wet/Packs Packing Bubble w/CS AZ		
Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other 1 & 2									
Possible Hazard Identification							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>							<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For 1 Months		
Special Instructions/QC Requirements & Comments: Two of the three Trip Blanks received from lab have 1/4 inch size bubbles.									
Relinquished by: 		Company: Bristol Environmental Remediation Services		Date/Time: 8/22/14 /1200		Received by: 		Company: TASEA	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	

Cooler ID No. 1 of 2TAL Work Order 45065

## COOLER RECEIPT FORM

Project WESTERN GASCooler received on 8/22/14 and opened on 1715 by FRANCISCO LUNA

(signature)

Temperature upon receipt:

Cooler: Corr          °C, Uncorr          °C Therm ID:         Temp. Blank: Corr 1.1 °C, Uncorr 1.4 °C Therm ID: A21. Were custody seals on outside of cooler and intact? YES NOa. If yes, how many and where: 2 FRONT & BACK

b. Were signature and date correct?

2. Were custody papers taped to lid inside cooler? YES NO3. Were custody papers properly filled out (ink, signed, etc)? YES NO4. Did you sign custody papers in the appropriate place? YES NO5. Did you attach shipper's packing slip to this form? YES NO6. What kind of packing material was used? BUBBLE7. Was sufficient ice used? ALL YES NO8. Were all bottles sealed in separate plastic bags? YES NO9. Did all bottles arrive in good condition (unbroken)? YES NO10. Were all bottle labels complete (no., date, signed, pres, etc)? YES NO11. Did all bottle labels and tags agree with custody papers? YES NO12. Were correct bottles used for the test indicated? YES NO13. If present, were voa vials checked for absence of airbubbles and noted if found? YES NO14. Adequate volume of voa vials received per sample? YES NO15. Was sufficient amount of sample sent in each bottle? YES NO16. Were correct preservatives used? YES NO17. Were extra labels added to pre-tared containers? YES NO NA

18. Corrective action taken, if necessary:

a. Name of person contacted:         b. Date:

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING  
239696

**Custody Seal**

SIGNATURE [Signature]  
DATE 6/22/18

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING  
239696

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING  
239697

**Custody Seal**

SIGNATURE [Signature]  
DATE 8/22/19

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING  
239697

Cooler ID No. 2 OF 2

TAL Work Order 45065

### COOLER RECEIPT FORM

Project WESTERN GAS

Cooler received on 8/22/11 and opened on 1715 by FRANCISCO LUNA

(signature)

Temperature upon receipt:

Cooler: Corr        °C, Uncorr        °C Therm ID:       

Temp. Blank: Corr 3.0 °C, Uncorr 3.3 °C Therm ID: A2

1. Were custody seals on outside of cooler and intact? YES ☒ NO
- a. If yes, how many and where: N/A
- b. Were signature and date correct? YES ☒ NO
2. Were custody papers taped to lid inside cooler? YES ☒ NO
3. Were custody papers properly filled out (ink, signed, etc)? YES ☒ NO
4. Did you sign custody papers in the appropriate place? YES ☒ NO
5. Did you attach shipper's packing slip to this form? YES ☒ NO
6. What kind of packing material was used? BUBBLE  
GEL
7. Was sufficient ice used? YES ☒ NO
8. Were all bottles sealed in separate plastic bags? YES ☒ NO
9. Did all bottles arrive in good condition (unbroken)? YES ☒ NO
10. Were all bottle labels complete (no., date, signed, pres, etc)? YES ☒ NO
11. Did all bottle labels and tags agree with custody papers? YES ☒ NO
12. Were correct bottles used for the test indicated? YES ☒ NO
13. If present, were voa vials checked for absence of airbubbles and noted if found? YES ☒ NO
14. Adequate volume of voa vials received per sample? YES ☒ NO
15. Was sufficient amount of sample sent in each bottle? YES ☒ NO
16. Were correct preservatives used? YES ☒ NO
17. Were extra labels added to pre-tared containers? YES ☒ NO na
18. Corrective action taken, if necessary:
  - a. Name of person contacted:
  - b. Date:





P.O. BOX 68900 SEATTLE, WA 98168  
800-225-2752 ALASKACARGO.COM

**SHIPPER**

Bristol Environmental  
111 W 16th Ave  
Anchorage, AK 99501

**CONSIGNEE**

Test America Laboratories Inc  
5755 8th Street E  
Tacoma, WA 98498

AWB Number	Pieces	Weight	Origin / Dest	Nature of Goods	Arriving Flight Details	Customs
027-12672542	2	46.0 Lb	YKM-SEA	WATER SAMPLES	AS 2201 22-Aug-2014	

Storage Locations: COOLER 2

**LOCAL CHARGES :**

Bonded Warehouse ☐

Total Local Charges:	USD	0.00
VAT 0.00%:	USD	0.00
Grand Total:	USD	<b>0.00</b>

PO Number

**RECEIPT STATEMENT**

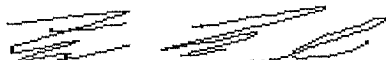
The undersigned acknowledge the receipt of above mentioned consignment complete and in good condition.

Date: 22-Aug-2014

Time: 16:00

Driver: Fransisco

Registration: \_\_\_\_\_

Signature: 

## Login Sample Receipt Checklist

Client: Bristol Env. Remediation Services LLC

Job Number: 580-45065-1

**Login Number: 45065**

**List Source: TestAmerica Seattle**

**List Number: 1**

**Creator: Abello, Andrea N**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Not requested on COC.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# US EPA Region 10 Laboratory

## Multi-Analyte Final Report



**Project Code :** HWD-221D

**Site :** WESTERN GAS LUST GW: EVENT 4

**Contact :** Rob Rau

**Account :** 2015F10P303D8610007

### Sample : 14484000

**Information :** MW-2B

**Matrix :** Water

**Collected :** 12/1/2014 12:15:00PM

**Parameter :** TPH-Gx

**Prep Method:** NWTPH-Gx - Gasoline range organics

**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	1520	ug/L		12/ 5/14	10
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	88	%Rec		12/ 5/14	10

### Sample : 14484001

**Information :** MW-2B

**Matrix :** Water

**Collected :** 12/1/2014 12:30:00PM

**Parameter :** TPH-Gx

**Prep Method:** NWTPH-Gx - Gasoline range organics

**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	1450	ug/L		12/ 5/14	10
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	90	%Rec		12/ 5/14	10

**Sample : 14484002****Information :** TPH-Gx Blank**Matrix :** Water**Collected :** 12/1/2014 11:00:00AM**Parameter :** TPH-Gx**Prep Method:** NWTPH-Gx - Gasoline range organics**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	50	ug/L	U	12/ 5/14	1
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	85	%Rec		12/ 5/14	1

**Sample : 14484000 Sample Duplicate****Information :** MW-2B**Matrix :** Water**Collected :** 12/1/2014 12:15:00PM**Parameter :** TPH-Gx**Prep Method:** NWTPH-Gx - Gasoline range organics**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	1520	ug/L		12/ 5/14	10
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	89	%Rec		12/ 5/14	10

**Sample : JW120414BL1 Blank****Information :** Blank**Matrix :** Liquid**Parameter :** TPH-Gx**Prep Method:** NWTPH-Gx - Gasoline range organics**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	50	ug/L	U	12/ 5/14	1
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	89	%Rec		12/ 5/14	1

**Sample : JW120514LCS1 Lab Control Std****Information :** Lab Control Standard**Matrix :** Liquid**Parameter :** TPH-Gx**Prep Method:** NWTPH-Gx - Gasoline range organics**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	93	%Rec		12/ 5/14	1
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	94	%Rec		12/ 5/14	1

**Sample : JW120514LCS2 Lab Control Std#2****Information :** Lab Control Standard Dup.**Matrix :** Liquid**Parameter :** TPH-Gx**Prep Method:** NWTPH-Gx - Gasoline range organics**Analysis Method:** NWTPH-Gx - Gasoline range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*90209	TPH-Gx Gasoline Range Organics	97	%Rec		12/ 5/14	1
<b>Surrogate Compounds:</b>						
540363	Benzene, 1,4-difluoro-	93	%Rec		12/ 5/14	1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 LABORATORY  
7411 Beach Dr. East  
Port Orchard, Washington 98366

QUALITY ASSURANCE MEMORANDUM  
FOR ORGANIC CHEMICAL ANALYSES

**Date:** January 5, 2015

**To:** Rob Rau  
Office of Compliance and Enforcement, USEPA Region 10

**From:** Chris Pace, Chemist  
Office of Environmental Assessment, USEPA Region 10 Laboratory

**Subject:** Quality Assurance Review for the Total Petroleum Hydrocarbon-Gasoline Range Extended Analysis of Samples from the Western Gas LUST GW: Event 4

Project Code: HWD-221D  
Account Code: 2015F10P303D8610007

The following is a quality assurance review of the data for gasoline range organics (TPH-Gx) of samples from the above referenced site. The analyses were performed by the EPA Region 10 Laboratory using Washington State Department of Ecology Method NWTPH-Gx.

This review was conducted for the following water samples:

14484000      14484001      14484002

**1. Data Qualifications**

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

The quality control measures which did not meet Laboratory/QAPP criteria are annotated in the title of each affected subsection with "*Laboratory/QAPP Criteria Not Met*".

For those tests for which the EPA Region 10 Laboratory has been accredited by The NELAC Institute (TNI), all requirements of the current TNI Standard have been met.

## **2. Sample Transport and Receipt**

Upon sample receipt, no conditions were noted that would impact data quality.

## **3. Sample Holding Times**

The concentration of an analyte in a sample or extract of a sample may increase or decrease over time depending on the nature of the analyte. The holding time maximum criteria applied to preserved water samples is 14 days from the time of collection. All samples were analyzed within the applicable criteria.

## **4. Sample Preparation**

Samples were prepared according to the method/SOP.

## **5. Initial Calibration**

Initial calibrations were performed on 12/4/14 for gasoline range organics and the surrogate, 1,4-difluorobenzene. Percent relative standard deviations (%RSDs) of the RRFs met the criteria of  $\leq 15\%$  or the correlation coefficients met the criteria of  $\geq 0.99$ .

## **6. Continuing Calibration Verification (CCV)**

The CCV met the criteria for frequency of analysis and relative retention time (RRT) windows for all target and surrogate compounds. The percent accuracies were 80-120% of the true values.

## **7. Blank Analysis**

Method blanks were prepared and analyzed with each sample extraction batch to evaluate the potential for laboratory contamination and effects on the sample results. TPH-Gx was not detected in the blanks.

## **8. Surrogates**

Surrogate recoveries are used to help in the evaluation of laboratory performance on individual samples. All surrogate recoveries for the samples were within the criteria of 50-150%.

## **9. LCS/LCSD**

Data for laboratory control sample/laboratory control sample duplicates (LCS/LCSD) are generated to provide information on the accuracy and precision of the analytical method and the laboratory performance. The LCS/LCSD recoveries were within the QAPP criteria of 50-150% with a relative percent difference (RPD) of  $\leq 35$ .

## **10. Duplicate Sample Analysis**

Duplicate sample analyses are performed to provide information on the precision, in the matrix of interest, of the analytical method. Duplicate analysis was performed using sample 14484000. All results which were above 5 times the reporting limit met the relative percent difference (RPD) criteria of  $\leq 35$ .

## **11. Compound Quantitation**

The initial calibration functions were used for calculations. Reported quantitation limits were based on the initial calibration standards and sample size used for the analysis.

All manual integrations have been reviewed and found to comply with acceptable integration practices.



## 12. Identification

Gasoline range organics is a collective term for volatile petroleum products, e.g. gasolines, naphtha, mineral spirits, stoddard solvent, and other volatile petroleum products.

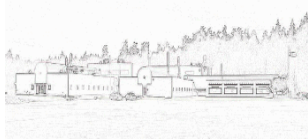
*Water Samples 14484000 and 14484001 resulted with gasoline range organics above the method reporting limit. The TPH-Gx GC/MS chromatograms of 14484000 and 14484001 most closely resemble weathered gasoline and potentially volatile components of a heavier fuel such as kerosene.*

## 13. Data Qualifiers

All requirements for data qualifiers from the preceding sections were accumulated. Each sample data summary sheet and each compound was checked for positive or negative results. From this, the overall need for data qualifiers for each analysis was determined. In cases where more than one of the preceding sections required data qualifiers, the most restrictive qualifier has been added to the data.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Chris Pace at the Region 10 Laboratory, phone number (360) 871 - 8703.

Qualifier	Definition
U	The analyte was not detected at or above the reported value.
J	The identification of the analyte is acceptable; the reported value is an estimate.
UJ	The analyte was not detected at or above the reported value. The reported value is an estimate.
R	The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable. <u>No value is reported with this qualification.</u>
NA	Not Applicable, the parameter was not analyzed for, or there is no analytical result for this parameter. <u>No value is reported with this qualification.</u>



# US EPA Region 10 Laboratory



## Multi-Analyte Final Report

**Project Code :** HWD-221D

**Site :** WESTERN GAS LUST GW: EVENT 4

**Contact :** Rob Rau

**Account :** 2015F10P303D8610007

### Sample : 14484000

**Information :** MW-2B

**Matrix :** Water

**Weight Basis :** N/A

**Collected :** 12/1/2014 12:15:00PM

**Parameter :** TPH-Dx

**Fraction :** N/A

**Prep Method:** 3535A - Solid Phase Extraction

**Analysis Method:** NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*400009	TPH-GC/Diesel Range Organics	0.43	mg/L		12/ 8/14	1
*400010	TPH-GC/Motor Oil Range Organics	0.56	mg/L	U	12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	87	%Rec		12/ 8/14	1

### Sample : 14484001

**Information :** MW-2B

**Matrix :** Water

**Weight Basis :** N/A

**Collected :** 12/1/2014 12:30:00PM

**Parameter :** TPH-Dx

**Fraction :** N/A

**Prep Method:** 3535A - Solid Phase Extraction

**Analysis Method:** NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*400009	TPH-GC/Diesel Range Organics	0.42	mg/L		12/ 8/14	1
*400010	TPH-GC/Motor Oil Range Organics	0.58	mg/L	U	12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	88	%Rec		12/ 8/14	1

**Sample : 14484003**

Information : TPH-Dx Blank

Matrix : Water

Weight Basis : N/A

Collected : 12/1/2014 11:00:00AM

Parameter : TPH-Dx

Fraction : N/A

Prep Method: 3535A - Solid Phase Extraction

Analysis Method: NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*400009	TPH-GC/Diesel Range Organics	0.19	mg/L	U	12/ 8/14	1
*400010	TPH-GC/Motor Oil Range Organics	0.46	mg/L	U	12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	89	%Rec		12/ 8/14	1

**Sample : 14484000 Sample Duplicate**

Information : MW-2B

Matrix : Water

Weight Basis : N/A

Collected : 12/1/2014 12:15:00PM

Parameter : TPH-Dx

Fraction : N/A

Prep Method: 3535A - Solid Phase Extraction

Analysis Method: NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*400009	TPH-GC/Diesel Range Organics	0.44	mg/L		12/ 8/14	1
*400010	TPH-GC/Motor Oil Range Organics	0.60	mg/L	U	12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	90	%Rec		12/ 8/14	1

**Sample : 74W120314B1 Blank**

Information : Blank

Matrix : Liquid

Weight Basis : N/A

Parameter : TPH-Dx

Fraction : N/A

Prep Method: 3535A - Solid Phase Extraction

Analysis Method: NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Target Analyte Results:</b>						
*400009	TPH-GC/Diesel Range Organics	0.20	mg/L	U	12/ 8/14	1
*400010	TPH-GC/Motor Oil Range Organics	0.50	mg/L	U	12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	90	%Rec		12/ 8/14	1

**Sample : 74W120314L1 Lab Control Std**

Information : Lab Control Standard

Matrix : Liquid

Weight Basis : N/A

Parameter : TPH-Dx

Fraction : N/A

Prep Method: 3535A - Solid Phase Extraction

Analysis Method: NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Spiked Compounds:</b>						
*400009	TPH-GC/Diesel Range Organics	81	%Rec		12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	95	%Rec		12/ 8/14	1

**Sample : 74W120314L2 Lab Control Std#2**

Information : Lab Control Standard Dup.

Matrix : Liquid

Weight Basis : N/A

Parameter : TPH-Dx

Fraction : N/A

Prep Method: 3535A - Solid Phase Extraction

Analysis Method: NWTPH-Dx - Diesel range organics

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
<b>Spiked Compounds:</b>						
*400009	TPH-GC/Diesel Range Organics	78	%Rec		12/ 8/14	1
<b>Surrogate Compounds:</b>						
629992	Pentacosane	91	%Rec		12/ 8/14	1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 LABORATORY  
7411 Beach Dr. East  
Port Orchard, Washington 98366

**QUALITY ASSURANCE MEMORANDUM  
FOR ORGANIC CHEMICAL ANALYSES**

**Date:** January 14, 2015

**To:** Rob Rau  
Office of Compliance and Enforcement, USEPA Region 10

**From:** Chris Pace, Chemist  
Office of Environmental Assessment, USEPA Region 10 Laboratory

**Subject:** Quality Assurance Review for the Total Petroleum Hydrocarbon-Diesel Range Extended Analysis of Samples from the Western Gas LUST GW Sampling (Event 4)

Project Code: HWD-221D  
Account Code: 2015F10P303D8610007

The following is a quality assurance review of the data for total petroleum hydrocarbon - diesel range extended (TPH-Dx) analysis of samples from the above referenced site. The analyses were performed by the US EPA Region 10 Laboratory in Port Orchard, WA, following US EPA and Laboratory guidelines.

This review was conducted for the following samples:

14484000      14484001      14484003

**Data Qualifications**

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

The quality control measures which did not meet Laboratory/QAPP criteria are annotated in the title of each affected subsection with "*Laboratory/QAPP Criteria Not Met*".

For those tests for which the EPA Region 10 Laboratory has been accredited by The NELAC Institute (TNI), all requirements of the current TNI Standard have been met.

## **1. Sample Transport and Receipt**

Upon sample receipt, no conditions were noted that would impact data quality.

## **2. Sample Holding Times**

The concentration of an analyte in a sample or extract of a sample may increase or decrease over time depending on the nature of the analyte. The holding time maximum criteria applied for the extraction of soil samples is 14 days from the time of collection. Extracts have a holding time maximum of 40 days from the time of preparation. All samples were extracted and analyzed within these criteria.

## **3. Sample Preparation**

Samples were prepared according to the method/SOP.

## **4. Initial Calibration**

Initial calibrations were performed on 10/28/14 for #2 diesel, motor oil and surrogate. Percent relative standard deviations (%RSDs) of the RRFs met the criteria of  $\leq 20\%$  or the correlation coefficients met the criteria of  $\geq 0.99$ .

## **5. Continuing Calibration Verification (CCV)**

The CCV met the criteria for frequency of analysis and relative retention time (RRT) windows for all target and surrogate compounds. The percent accuracies were 80-120% of the true values.

## **6. Blank Analysis**

Method blanks were prepared and analyzed with each sample extraction batch to evaluate the potential for laboratory contamination and effects on the sample results. TPH-Dx was not detected in the blanks.

## **7. Surrogates**

Surrogate recoveries are used to help in the evaluation of laboratory performance on individual samples. All surrogate recoveries for the samples were within the criteria of 50-150%.

## **8. LCS/LCSD**

Data for laboratory control sample/laboratory control sample duplicates (LCS/LCSD) are generated to provide information on the accuracy and precision of the analytical method and the laboratory performance. The LCS/LCSD recoveries were within the criteria of 70-130% with a relative percent difference (RPD) of  $\leq 30$ .

## **9. Duplicate Sample Analysis**

Duplicate sample analyses are performed to provide information on the precision, in the matrix of interest, of the analytical method. Duplicate analyses were performed using sample 14484000. All results which were above 5 times the reporting limit met the relative percent difference (RPD) criteria of  $\leq 35$ .

## 10. Compound Identification/Quantitation

The initial calibration functions were used for calculations. Reported quantitation limits were based on the initial calibration standards and sample size used for the analysis.

Diesel range organics is a collective term for petroleum products that generally elute before motor oil but after gasoline from the gas chromatograph.

***Water samples 14484000 and 14484001 resulted with diesel range organics above the method reporting limit. The GC/FID chromatograms of 14484000 and 14484001 most closely resemble weathered gasoline and/or weathered kerosene.***

Motor oil range organics is a collective term for any petroleum product that chromatographically consists primarily of an unresolved envelope of compounds generally eluting after #2 diesel. Included in the definition are hydraulic fluids, motor oils, lubricating oils, cutting oils, mineral oils, transmission fluids, etc.

Chemical Abstract Service (CAS) numbers with a “\*” indicates that the number was created at the Region 10 Laboratory due to lack of an existing one.

All manual integrations have been reviewed and found to comply with acceptable integration practices.

## 11. Data Qualifiers

All requirements for data qualifiers from the preceding sections were accumulated. Each sample data summary sheet and each compound was checked for positive or negative results. From this, the overall need for data qualifiers for each analysis was determined. In cases where more than one of the preceding sections required data qualifiers, the most restrictive qualifier has been added to the data.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Chris Pace at the Region 10 Laboratory, phone number (360) 871 - 8703.

Qualifier	Definition
U	The analyte was not detected at or above the reported value.
J	The identification of the analyte is acceptable; the reported value is an estimate.
UJ	The analyte was not detected at or above the reported value. The reported value is an estimate.
R	The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable. <u>No value is reported with this qualification.</u>
NA	Not Applicable, the parameter was not analyzed for, or there is no analytical result for this parameter. <u>No value is reported with this qualification.</u>



**ATTACHMENT 6**

Waste Disposal Documents



Corporate Office  
7343 E. Marginal Way South  
Seattle, WA 98108  
Tin# 91-1578671

1-888-832-3008

**Customer Bill of Lading - Washington**

Bill of Lading # **014288**

**THIS IS NOT AN INVOICE**

Manifest # \_\_\_\_\_

**Destination Facilities:**

- ☐ 1500 Airport Way South  
Seattle, WA 98134  
EPA ID#WAD058367152
- ☐ 1825 Alexander Avenue  
Tacoma, WA 98421  
EPA ID#WAD981769110
- ☐ 1799 East Ainsworth  
Pasco, WA 99301  
EPA ID#WAH000041824
- ☒ 6308 E Sharp Ave  
Spokane Valley, WA 99212  
EPA ID#WAH000042987
- ☐ 1300 West 12th Street  
Vancouver, WA 98660  
EPA ID#WAD068794387

Business Name: <b>Western Gas</b>		Business Phone: <b>907-563-0013</b>	Date: <b>9-18-14</b>
Site Address: <b>401 S. Elm ST TOPPENISH, WA. 98848</b>		Billing Address: <b>111 W. 16TH AVE ANCHORAGE, AK 95501</b>	Driver Name: <b>1</b>
Site Contact Person: <b>TYLER ELLINGBOE</b>		A/P Contact Person: _____	Route Number: <b>150</b>
Site Contact Email: _____		A/P Contact Email: _____	Equipment Number: _____
			P.O. Number: _____
			Industrial Order Number: _____

**Products & Services**

Service Levels and Frequency/s:

Item	Product Name	Profile Number	# of Cont.	Cont. Type	Qty./Vol.	UOM	Unit Price	Amount
	Net Used Oil Volume Collected	G00505						
	Chlor D Test Test™ / HH (Not intended for detection of PCBs)	PASS / FAIL						
06009	Off Spec Fuel RQ, UN1993, Flammable Liquids, n.o.s. (Gasoline), 3, PGII, ERG#128	G02901						
	Part-Washer Service INTERVAL MOD / COM							
11007	Used 150 Solvent (MANIFEST REQUIRED IF MQG OR LQG) RQ, UN1993, Flammable Liquids, n.o.s. (Benzene, Lead), 3, PGII, ERG#128	88882						
03001	Spent Antifreeze ( Recycling ) Material not regulated by DOT (Washington State Dangerous Waste Only, Toxic)	AF78						
	Antifreeze, New 100% / 50-50 Green / Yellow / Red							
0100314	SOLIDS G004706				1	EA		182.38
1200414	WASTE WATER G00707				1	EA		125.00
	Used Oil Filters Crushed / Uncrushed Contaminated	G04715						
01001	Used Absorbent Pads	G00504						
9162677	Service & Compliance Fee / Screening Fee				1	EA		29.50
9020977	Energy Recovery Fee				1	EA		18.50
3391061	Truck/Operator Time							
	Subtotal							355.38
	Sales Tax (10.1%)							24.28

Payment Method: Driver Check / Corporate Check / Account Credit

TOTAL AMOUNT:

**379.66**

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I further declare that this material is not regulated as a hazardous waste, dangerous waste, or PCB waste under WAC 173-303, 40CFR Part 261, or 40 CFR Part 761 unless otherwise described on an accompanying hazardous waste manifest. If shipping used oil, as generator, I certify that this used oil meets the definition of used oil in 40CFR Part 279 and WAC 173-303-515. Generator agrees to indemnify and hold harmless Emerald Services, Inc. or its subsidiaries for any damages, costs, attorney's fees, and expert fees arising out of or in any way related to a breach of the above certifications.

CHEMTREC, 24 Hour Emergency Response Line 1-800-424-9300 Contract #7619

**Bob Rau**  
Generator Authorized Rep. Printed Name:  
U.S. EPA RIO

Generator Authorized Rep. Signature / Date:

Transporter Signature / Date:

SALES/DISPATCH



## **CERTIFICATE OF DISPOSAL**

On November 4<sup>th</sup>, 2014 the Emerald Recycling facility located at 1500 Airport Way S., Seattle WA 98134, received a shipment from:


**Western Gas  
401 S. Elm St.  
Toppenish, WA 98848**

**On Manifest Number: 014288**

Manifest Line	1
Profile Number	G04706
Process	Consolidation
Date of Process:	11/5/14

Manifest Line	2
Profile Number	G00707
Process	Waste Water
Date of Process:	11/5/14

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste or material was managed in compliance with all applicable laws, regulations, permits, and licenses on the date listed above.

	11/5/2014
Facility Representative	Date of Issue